COMPARATIVE TEST OF CENTRIFUGAL BLOWERS

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centrifugal blowers

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OF
CENTRIFUGAL BLOWERS

A THESIS

PRESENTED BY

FRANCIS H. GRIFFITHS
AND
G. FRED CUMMINS

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COMPARATIVE TEST OF CENTRIFUGAL BLOWERS.

The following experiments were carried on to determine by a series of comparative tests, the more efficient of two types of centrifugal blowers, both of the same overall dimensions, but having different shaped blades set at different angles to the radii.

The blowers tested will be compared, first for mechanical efficiency, and second for capacity under various conditions of restricted suction orifice. The discharge duct will be kept constant for all orifices above seven inches in diameter, while with all orifices less than seven a six inch Venturi nozzle will be used in connection with the discharge duct.

The general theory of the blower, with all deductions, will be presented regardless of the design of the blower.

The most satisfactory theory of the blower was presented by Daniel Murgue and is as follows:

The maximum head produced by any blower is equal to twice the head which would be produced by a velocity equal to that of the periphery.

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In the ordinary type of blower the actual head produced, Margue proves, is equal to twice the height of a column necessary to generate the same velocity in a freely falling body. If this velocity is equal to u feet per second and H the maximum head, then the reading produced on the gauge is

$$H = \frac{u^2}{g}$$

If we let Q equal the quantity of air delivered per second, H_o the head produced when the discharge duct is completely closed, which is the initial reading, with h_o the loss of head through the fan, and h the effective head, the total head produced by a fan is therefore equal to the sum of h and h_o or,

Therefore the effective head is $h = H - h_o$

The air supplied to the fan may be considered to be practically motionless, which is not essentially true, but since the head produced by the velocity is small it may be neglected without any serious error. The air in passing into the fan is accelerated and given a velocity equal to V_o, which would then produce

a negative head equal to H_o or,

$$H = -\frac{V_o^2}{2g} \qquad (1)$$

Upon entering the vanes the air has a velocity equal to V_1 and upon leaving has a velocity equal to V_2, which is somewhat less than V_1, the loss being caused by the increase of area between vanes, which in turn increases the discharge pressure. Writing Bernonilli's theorem for the decrease in velocity and increase in pressure, a gain in pressure equal to

$$\frac{1}{2g}\left(V_1^2 - V_2^2\right) \qquad (2)$$

is obtained.

The velocity V_1 obtained is the resultant of two velocities, the one V_o, being due to centrifugal force, and the other, which is tangential to the vanes, is equal to $\underline{w}\ \underline{i}$, and if there are no losses the velocity at entrance to the vanes is

$$V_1^2 = V_o^2 + w^2 r^2 \qquad (3)$$

Substituting the value of V_1^2 in equation (2) we get

$$\frac{1}{2g}\left(V_o^2 + w^2 r^2 - V_2^2\right) \qquad (4)$$

The value of the centrifugal force is not constant making it necessary to determine some expression which will give the value. Assume a small element of air at a distance x from the center of the fan, base area equal to S, whose dimension along the radius is dx and density δ. The mass of this element then becomes equal to

$$\frac{V\delta}{g} = \frac{S\,dx\,\delta}{g} \qquad (6)$$

The centrifugal force produced is therefore

$$dF = \frac{\delta\, S\, \omega^2 x\, dx}{g} \qquad (7)$$

Dividing equation (6) by S, the area of base of the little element and the density δ, we have the pressure per unit of area as follows

$$dh = \frac{\omega^2 x\, dx}{g}$$

Integrating between the limits x = r x = R

$$h = \frac{\omega^2}{g}\int_r^R x\,dx = \frac{\omega^2}{g}(R^2 - r) \qquad (8)$$

Adding equations (1), (4) and (8) together, where w is equal to wR, the intial reading becomes

$$H = \frac{1}{2g}\left(-V_0^2\right) + \frac{1}{2g}\left(V_0^2 + \omega^2 r^2 - V_2^2\right) + \frac{\omega^2}{2g}\left(R^2 - r^2\right)$$

Reducing

$$H = \frac{1}{2g}\left(u^2 + V_2^2\right) \qquad (9)$$

The above equation shows conclusively that the pressure or static head decreases very rapidy as the velocity head, or V, increases. If it were possible to have the velocity of the air equal to that of the periphery the static pressure would become zero.

Computation.

All computations are taken from the run using the 9" on suction, and large motor driving the fan. The run may be found on pages and .

R.P.M. of fan, knowing R.P.M. of motor

R.P.M. of motor = 870

R.P.M. of fan =

870 X 1.458 = 1268

Peripheral velocity in feet per second, Ph

$$\frac{1268}{60} \times \pi D$$

$$\frac{1268 \times \pi \times 2}{60 \times 4} = 132.8 \text{ ft. per sec.}$$

Watts input (W) = $110 \times 22\frac{1}{2} = 2475$

Conversion of inches of water into feet of air, by Boyle's law

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$V_2 = \frac{P_1 V_1 T_2}{T_1 P_2}$$

$$= \frac{29.92 \times 12.39 \times (460 + 64)}{(460 + 32) \times 29.7}$$

$$= \frac{29.92 \times 12.39 \times 524}{492 \times 29.7} = 13.3 \text{ cu. ft.}$$

which is equal to one pound of air.

To the above weight of air (1 lb.) must be added the weight of moisture in the air.

Weight of moisture under running conditions from Marks & Davis Steam Tables, page 8, table I,

.000946 lbs. per cubic foot.

$000946 \times 13.3 \times .47 = 00592$ #

to be added to the one pound of dry air so that 13.3 cubic feet of moist air weighs

$1 + 00592 = 1.00592$ #

Inches of water to feet of air under running conditions

$$\frac{62.5 \times 13.3}{12} \times 1.0059 = 69.8 \text{ ft. of air}$$

which is equal to one inch of water.

Seventy-one feet of air was assumed to be equivalent to one inch of water for all computations, as it was found to be the average of several computations for the above value.

Suction head in feet of air.

Suction in inches of water 4.62 (S_A)

$4.62 \times 71 = 328 \quad = \quad$ feet of air

Static head in feet of air (P_A)

Static head in inches of water .035

$0.035 \times 71 \quad = 2.485$ feet of air

Velocity head in feet of air (V_D)

Velocity head in inches of water .570

$.570 \times 71.0 = 40.47$ feet of air

Total head: $S_a + P_a + V_D = H_A$

$H_a = 328 + 2.485 + 40.47 = 370.955$

Velocity of air in duct, feet per second,

$V = \sqrt{2g V_D}$

$V_D = 40.47$

$V = 8.02 \sqrt{40.47}$

V = 51 feet per second.

Cubic feet per second, =

$V \times A$ where $A = \frac{\pi D^2}{4 \times 144}$, D in inches

$51 \times .7854 = 40.4$ cubic feet.

Pounds of air moved per second,

One cubic foot of air under average working conditions weighed 0.073 lbs.

$40.4 \times .073 = 2.922$ lbs. per sec.

Horse power delivered by fan,

$$\frac{\text{lbs air delivered} \times \text{total head}}{550}$$

$$\frac{2.922 \times 370.96}{550} = 1.97 \text{ H.P.}$$

Horse power delivered to fan by motor taken from calibration curves for 5 h.p. motor,

H.P. in = 2.605

Mechanical efficiency in per-cent,

$$\frac{1.97}{2.605} \times 100 = 75.7\ \%$$

Manometric efficiency,

$$\text{M.E. } \% = \frac{Ha}{\frac{(P_k)^2}{g}} \times 100 = \frac{Ha \times g}{(P_k)^2} \times 1$$

$$= \frac{370.96 \times 32.2}{(132.8)^2} \times 100 = 65.4\ \%$$

Apparatus.

Two interpole variable speed motors, manufactured by Electro Dynamic Company, were required by this test, a 5 h.p. and a 3/4 h.p., which allowed us to get a speed of from 390 to 1800 R.P.M. at the fan pulley. In connection with the motors two ammeters (0-15 and 0-50) amperes were used and one 110 voltmeter.

One carbon plate rheostat was used in the line to regulate voltage.

One direct reading tachometer, speed range 100 to 4000 R.P.M.

Five Ellison differential draft gauges reading directly in inches of water.

Two, 8" gauges.

One, 3" gauge.

One, 1-1/2" gauge.

One, 1" gauge.

Wet and dry bulb thermometers.

One aneroid barometer.

Orifice plates ranging from 0"-11", 0"-3", 3"-11" in diameter, inclusive by 1" range.

Installation and Calibration of Apparatus.

The usual method of calibration of motors was used; that of the prony brake, the reading of the input

current I, the voltage and speed of the motor. In the calibration of the 5 h.p. motor the voltage (line) was allowed to take care of itself; that is, there was no rheostat placed in the line to regulate the voltage for all loads to 110 volts. Each point of the rheostat was calibrated from zero to 175 % of full load.

The tare weight on the scales was determined by suspending the brake on its central axis mounted on knife edges, which gave directly the dead load on scales, or the weight necessary to be subtracted from all scale load readings.

From the data thus obtained curves were plotted with watts input as ordinates and horse power at the brake as abscissae. Since there were 21 points on the rheostat calibrated for the 5 h.p. motor it was necessary to move each successive curve along 5 centimeters to avoid overlapping of the curves, correction for all abscissae reading being shown on the blue prints.

In calibrating the small motor considerable trouble was experienced in that the power delivered at the brake was so small that it was difficult to obtain accurate

readings. This was overcome by using a strap brake, the radius of which was approximately that of the water cooled pulley. The brake strap was lined with a composition lining and lubrioated with a heavy coat of graphite and cylinder oil, enabling all readings of amperes input to be taken with no variation of the ammeter. The line voltage was maintained at 110 volts by use of the carbon plate rheostat in the line outside of the instruments, so that no power indicated by the instruments was consumed by the rheostat. The ammeter used (0-15 amps) read to 1/100 of an ampere.

In determining the brake arm of the strut used it was necessary to use the ordinary type of prony brake, with three accurately measured arms of 12", 9" and 6". There were no corrections to be made for scale loads, as it was accurately counter weighed. By the law of the lever it was possible to determine the unknown arm of the strap brake. The voltage in each case was kept at 110 volts, and ammeter readings taken to correspond with ampere readings of the strap brake. The average of a series of readings being assumed to give the correct brake arm.

The curves for the small motor were plotted

with amperes input as ordinates and horse power at the brake as abscissae, which was possible owing to the fact that the voltage was kept at 110 volts throughout the entire calibration.

The meters used in these tests were of the Weston direct reading type, manufactured by the Weston Electrical Instrument Company, Newark, N. J. The volt meter was model 1, # , and had two scales, 0-2.5 and 0-120. The ammeters were model 1, # , 0-15, 0-50, and 0-120. The instruments were checked against standard instruments and found nearly correct. The error was so small that it was negligible, and all readings for calculations were assumed correct.

The scale, #13, used in connection with the calibration of the motors was standardized by placing standard weights upon it and was found correct within weighing limits.

The tachometer was calibrated against a frequency meter and for all readings it was found correrct for all experimental work.

Installation of the Blower.

The first installation of the fan was with the shaft of the runner in a vertical position, rotating

upon a self centering roller bearing, with the suction opening upon the upper side of the fan casing. The suction chamber was bolted directly to the opening in the casing and the joint made perfectly tight by the use of heavy cup grease. The opening around the runner shaft on the under side of the casing could not be made perfectly air tight, as the opening had to be made large enough to allow the shaft to obtain its true rotating center. Several experiments were made by placing soft washers, such as leather, around the shaft, but to no avail. The leakage was determined by figuring the quantity of air delivered by the fan and comparing this value with quantity delivered through the suction orifice. The leakage was found to be entirely too great for accurate work, necessitating an entirely different form of installation, as shown on page .

The second installation of the fan was with the shaft of the runner in a horizontal position. The shaft being mounted in babbitted bearings, the inner bearing coming up close to the wheel casing. This method permitted the use of cup grease in sealing the joint around the shaft. All joints in the wheel case were made up with grease. The

orifice plates were fastened to the suction chamber by placing them in a bed of cup grease, which made it nearly impossible to find any leakage at this point. Several tests were run under these conditions for leakage, as in the first run, and the quantities so obtained were nearly equal, which allowed all subsequent calculations to be carried on neglecting leakage.

The suction chamber spoken of in the above paragraphs consisted of a large cylindrical galvanized iron tank, four feet in diameter and five feet in length. One end was so arranged that the orifice plates could be attached as stated above. The other end of the chamber was arranged with a two foot opening gradually tapering off to the size of the suction opening in the wheel casing. The purpose of using the large suction chamber was to do away with the velocity head, converting the entire suction head into static pressure, because the velocity head is practically zero in the chamber.

The static and velocity head in the 12" discharge duct was obtained by a modified form of the Pitot tube method. The ordinary type of the dynamic tube was placed at the mean radius of the duct,

which was 48" from the center. The static head in the duct was obtained by drilling four small holes through the duct and connecting these in series, so that the actual static head obtained was the resultant of the four pressures taken in the duct. This method of obtaining the static pressure has been tryed out very thoroughly in Europe, and gave very accurate determinations of the pressure of flowing air.

The gauges used during the entire test were of the Lewis M. Ellison type of differential manometer, reading directly in 1/100 of an inch of water. The gauges used on the static and velocity head readings were direct, reading to 1/100 inches of water but of larger scale division so that readings to 1/1000 of an inch could be interpolated.

The plan view of motors, fan, and suction chamber will show the arrangement of the motors. The same belt was used on both motors with the exception of the removal of a small piece of the belt to shorten up to take in the small motor. The ammeter used in connection with the small motor read directly in 1/100 amperes, and that with the large motor directly to 1/10 amperes.

The pulley ratio was determined by using two speed indicators; one upon the shaft of the motor and the other upon the fan shaft. Both indicators were brought to zero and placed in their respective positions, while the motor and fan were still. The motor was then brought up to some speed and allowed to run for two or three minutes. It was then stopped, still keeping the indicators in their position. When the motor had come to rest the readings of both indicators were recorded, and the ratio of the recorded revolutions of the motor to those of the fan gave the required constant, or pulley ratio.

The flow of air with the small orifice was so sluggish in the 12" duct, making it necessary to use some other form of measurement. A venturi nozzle was devised with area of the throat equal to 0.21 square feet. The velocity head through the nozzle was found to be equal to the difference of the static pressure up stream and that at the throat of the nozzle; from this accurate data as to the velocity head in the duct was obtained.

In determining the leakage of the fan system, with the blank orifice on the suction, a 1-1/4" orifice plate was placed over the discharge duct

outlet. The static pressure in the duct being assumed to be converted into velocity pressure through the orifice from the reading the quantity of air flowing may be calculated from the formula,

Where n is the coefficient of discharge and equal to .6, A the area of the orifice in square feet and h the velocity head through the orifice in feet of air.

Discussion and Comparison of Results.

The curves from the test were plotted with R.P.M. as abscissae, and efficiency, horse power, capacity, dynamic, velocity and total static heads as ordinates. The curves give a very simple means of comparing the results that may be expected of these types of fans, from which it is easy to determine which fan would be the more economical under particular conditions of operation.

Both runners were of the exhaust type, intended for work in which a suction of a few inches of water are required. This gave the condition of throttled suction and comparatively light discharge pressure.

The two runners used throughout the experiment are designated as "straight or curved blade" fans, the term "curved blade" signifying the runner in which the vanes were curved away from the direction of rotation, while in the fan with the so called "straight blade, the angle which the vanes made with a given radius, remained constant.

The maximum efficiency of both fans running at 1600 R.P.M. with the same area discharge was obtained with the 9" suction orifice in both cases, which is the blast area. The maximum efficiency of the test was obtained with the curved blade runner at 1600 R.P.M., showing that 78% of the input power was delivered by the fan. The straight blade runner obtained its maximum efficiency with the nine inch orifice, but not until the R.P.M. of the fan reached 1800, showing an efficiency of 66%. Comparing the two runners under the same conditions of operation, the maximum efficiency of the curved balde runner was 78% as against 64% for the straight blade runner, a gain of 14% in favor of the curved blade fan. The maximum possible efficiency with the straight blade runner

was not obtained, because of lack of power and draft gauge capacity. The efficiency curve, for the straightblade fan with the 9" suction orifice, is still increasing at 1800 R.P.M., which is the maximum speed at which the fan could be operated. It is very probable that the maximum efficiency obtained with the straight blade runner would be at about 2000 R.P.M., with a 9" suction orifice, and would be about 70%, which is even then 8% below the maximum efficiency of the curved blade runner.

The manometric efficiency for any particular orifice with either impeller remains practically constant throughout the entire run, and in no case did the efficiency exceed 70%.

The two fans compared for capacity in cubic feet per second, places the curved blade runner far in advance of the straight blade runner. At 1600 R.P.M. the curved blade impeller delivered 62-1/2 cubic feet of free air per second with the 11" orifice, on the suction side of the fan, as against 51.1 cubic feet of free air per second for the straight blade runner under similar conditions. With the 9" orifice on the suction side of the fan 50 cubic feet of free air were delivered by the curved

blade as against 45.3 cubic feet per second for the straight blade. The large volume delivered by the curved blade impeller is very much in favor of the fan.

The horse power required by the curved blade runner is much smaller than that required by the straight blade runner for the same quantity of delivered air. Comparing the two runners with the 9" suction orifice and at 1560 R.P.M., the curved blade fan required 4.45 horse power as against 4.03 by the straight blade runner, but the quantity of air delivered in both cases is much larger for the curved blade, as is also the efficiency at this point.

The total static pressure consists of the sum of the suction pressure and the static pressure in the duct. The curves plotted with R.P.M. as anscissae and total static head in inches of water, are very much in favor of the curved blade runner. In both cases the static head increases only slighly up to about 800 R.P.M. and from that point begins to increase very rapidly. If the static pressures are compared for the 9" orifice on the suction

and 1600 R.P.M., we find that the curved blade shows a pressure of 7.1" of water pressure as against 5.38" for the straight blade impeller, or 1.72 inches of pressure in favor of the curved blade runner. The entire test gives a very large preference in favor of the curved blade fan for all orifices. This is primarily brought about by the large capacity of the curved blade fan, for at no time does the static pressure on the discharge become very large.

The curves plotted with total dynamic head as ordinates against R.P.M. as abscissae show several very interesting points. This is especially true for the curved blade runner, since for the 3, 4, 5, 6, 7, 8 and 9 inch orifices one curve could be drawn with a very small error for any particular orifice. For all practical purposes the same conclusions may be drawn for the Dynamic - R.P.M. curves as for the Total Static - R.P.M. curves.

The velocity - R.P.M. curves are only another form of capacity curves and will not be discussed at length here. As would naturally be expected the maximum velocity head would be obtained with the 11"

suction orifice . If the two impellers are compared with the orifice and at 1600 R.P.M. it is interesting to note that the curved blade shows a velocity head of 1.33 inches of water as compared with 1.09 inches for the straight blade or an increase of .24 inches favoring the curved blade impeller.

General Conclusions.

The entire test is very much in favor of the "curved" blade impeeler, both for capacity and efficiency. An installation of two fans of the same capacity, but of the two individual designs, would leave a large margin in favor of the curved; first ground space and second input horsepower, for at the best efficiency of the curved impeller 12% of the power is saved by this style of runner, equivalent to about 1/8th of the entire input. The capacity of the curved balde is also much larger, for at 1600 R.P.M, this type of fan delivered 62-1/2 cubic feet of free air as against 51.1 cubic feet for the straight blade.

MOTOR CALIBRATION

$\frac{3}{4}$ H.P. MOTOR NO. 15--4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS-110

LENGTH BRAKE ARM = 2.088 INCHES BRAKE TARE WEIGHT = 4.15 LBS.

NOTCH #1					NOTCH #2				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
330	1.65	4.97	.82	.00864	395	1.35	4.32	.17	.0223
328	2.00	9.55	5.40	.0587	390	2.00	12.34	8.19	.1058
322	2.50	16.40	12.25	.1308	383	2.50	18.10	13.95	.1770
318	3.00	22.97	18.82	.1985	377	3.00	23.83	19.68	.246
313	3.50	29.74	25.59	.2655	371	3.50	29.17	25.02	.310
309	4.00	37.01	32.86	.3365	366	4.00	34.78	30.63	.372
305	4.50	43.68	39.53	.4000	365	4.50	40.13	35.98	.435
301	5.00	49.90	45.75	.4562	360	5.00	45.60	41.45	.494
300	5.50	57.04	52.89	.5260	355	5.50	50.58	46.43	.546
295	6.00	62.95	58.80	.5742	350	6.00	56.28	52.13	.604
290	6.50	69.62	65.47	.6290	346	6.50	62.51	58.36	.669
285	7.00	76.93	72.78	.6870	340	7.00	67.43	63.28	.713

MOTOR CALIBRATION

$\frac{3}{4}$ H.P. MOTOR NO. 15--4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS-110

NOTCH #3					NOTCH #4				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
460	1.5	6.7	2.55	.0389	550	1.2	4.30	.15	.00273
454	2.0	11.9	7.75	.1164	545	1.5	7.04	2.89	.0522
445	2.5	16.74	12.59	.1855	535	2.0	11.62	7.47	.1328
439	3.0	21.59	17.44	.2538	530	2.5	15.64	11.49	.2018
431	3.50	26.22	22.07	.3150	523	3.0	19.57	15.42	.2672
430	4.00	30.82	26.67	.3800	520	3.5	23.02	18.87	.3250
425	4.50	34.90	30.75	.4332	512	4.0	26.50	22.35	.3763
419	5.00	39.92	35.77	.4965	506	4.5	29.87	25.72	.4320
415	5.50	43.93	39.78	.5470	500	5.0	33.25	29.10	.4820
409	6.00	48.35	44.20	.5990	495	5.5	37.71	33.56	.5505
405	6.50	52.97	48.82	.6560	490	6.0	40.87	36.72	.5965
400	7.00	58.03	53.88	.7150	480	6.5	44.78	40.63	.6460
					474	7.0	48.10	43.95	.6910

MOTOR CALIBRATION

$\frac{3}{4}$ H.P. MOTOR No 15--4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS-110

NOTCH #5					NOTCH #6				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
643	1.2	4.53	.38	.0081	727	1.15	4.51	.36	.0068
639	1.5	7.04	2.89	.0612	720	1.5	6.89	2.74	.0654
629	2.0	10.95	6.80	.1417	711	2.0	10.35	6.20	.1460
623	2.5	14.10	9.95	.2110	709	2.5	13.05	8.90	.2180
615	3.0	17.25	13.10	.2670	705	3.0	15.73	11.58	.2715
611	3.5	20.36	16.21	.3283	700	3.5	18.28	14.13	.3278
604	4.0	23.00	18.85	.3774	695	4.0	20.57	16.42	.3782
600	4.5	25.83	21.68	.4310	685	4.5	22.77	18.62	.4230
590	5.0	28.60	24.45	.4780	680	5.0	25.20	21.05	.4745
583	5.5	31.60	27.45	.5300	672	5.5	27.68	23.53	.5250
575	6.0	34.82	30.67	.5840	667	6.0	30.54	26.39	.5790
570	6.5	37.21	33.06	.6240	660	6.5	32.81	28.66	.6275
560	7.0	40.11	35.96	.6675	655	7.0	34.72	30.57	.6640

MOTOR CALIBRATION
$\frac{3}{4}$ H.P. MOTOR No. 15---4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS- 110

NOTCH #7					NOTCH #8				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
825	1.15	4.47	.32	.0088	935	1.15	4.45	.30	.0093
817	1.50	6.70	2.55	.0690	924	1.50	6.05	1.90	.0583
810	2.00	9.61	5.46	.1466	920	2.00	8.51	4.36	.1329
805	2.50	12.20	8.05	.2148	913	2.50	11.10	6.95	.2105
800	3.00	14.30	10.15	.2690	910	3.00	13.25	9.10	.2745
797	3.50	16.71	12.56	.3320	900	3.50	15.50	11.35	.3390
795	4.00	18.49	14.34	.3780	895	4.00	16.95	12.80	.3800
783	4.50	20.59	16.44	.4270	890	4.50	19.28	15.13	.4460
778	5.00	22.73	18.58	.4790	885	5.00	21.30	17.15	.5030
772	5.50	24.96	20.81	.5330	885	5.50	23.02	18.87	.5540
767	6.00	26.74	22.59	.5740	877	6.00	24.57	20.42	.5940
760	6.50	28.58	24.43	.6155	870	6.50	26.33	22.18	.6395
745	7.00	30.72	26.57	.6560	860	7.00	28.15	24.00	.6840

MOTOR CALIBRATION
$\frac{3}{4}$ H.P. MOTOR No. 15--4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS-110

NOTCH #7					NOTCH #8				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
825	1.15	4.47	.32	.0088	935	1.15	4.45	.30	.0093
817	1.50	6.70	2.55	.0690	924	1.50	6.05	1.90	.0583
810	2.00	9.61	5.46	.1466	920	2.00	8.51	4.36	.1329
805	2.50	12.20	8.05	.2148	913	2.50	11.10	6.95	.2105
800	3.00	14.30	10.15	.2690	910	3.00	13.25	9.10	.2745
797	3.50	16.71	12.56	.3320	900	3.50	15.50	11.35	.3390
795	4.00	18.49	14.34	.3780	895	4.00	16.95	12.80	.3800
783	4.50	20.59	16.44	.4270	890	4.50	19.28	15.13	.4460
778	5.00	22.73	18.58	.4790	885	5.00	21.30	17.15	.5030
772	5.50	24.96	20.81	.5330	885	5.50	23.02	18.87	.5540
767	6.00	26.74	22.59	.5740	877	6.00	24.57	20.42	.5940
760	6.50	28.58	24.43	.6155	870	6.50	26.33	22.18	.6395
745	7.00	30.72	26.57	.6560	860	7.00	28.15	24.00	.6840

MOTOR CALIBRATION

$\frac{3}{4}$ H.P. MOTOR   NO. 15--4112
BUILT BY   ELECTRO DYNAMIC CO.
VOLTS- 110

NOTCH #9					NOTCH #10				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
1050	1.2	4.52	.37	.0129	1160	1.25	4.47	.32	.0123
1038	1.5	5.88	1.73	.0595	1155	1.5	5.28	1.13	.0433
1030	2.0	8.02	3.87	.1322	1150	2.0	7.44	3.29	.1255
1026	2.5	10.21	6.06	.2061	1147	2.5	9.20	5.05	.1835
1022	3.0	12.22	8.07	.2731	1133	3.0	11.22	7.07	.2653
1019	3.5	14.04	9.89	.3340	1127	3.5	12.84	8.69	.3245
1010	4.0	15.85	11.70	.3918	1125	4.0	14.37	10.22	.3810
1010	4.5	17.45	13.30	.4458	1115	4.5	16.05	11.90	.4400
1006	5.0	19.02	14.87	.4960	1105	5.0	17.42	13.27	.4860
993	5.5	20.62	16.47	.5420	1090	5.5	18.96	14.81	.5350
981	6.0	22.20	18.05	.5870	1088	6.0	20.23	16.08	.5780
975	6.5	23.68	19.59	.6315	1073	6.5	21.91	17.76	.6315
950	7.0	25.59	21.44	.6750	1063	7.0	23.05	18.90	.6660

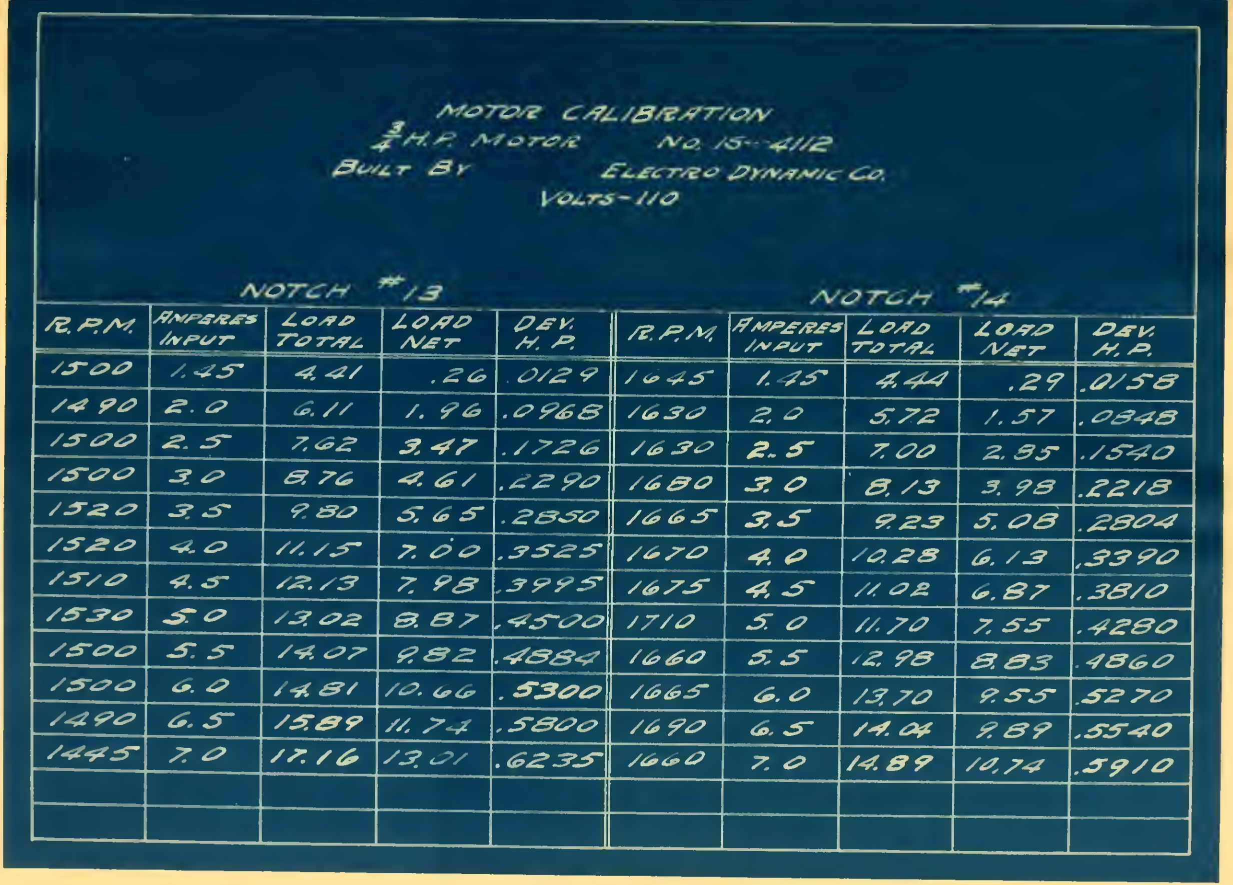
MOTOR CALIBRATION

$\frac{3}{4}$ H.P. MOTOR No. 15--4112

BUILT BY ELECTRO DYNAMIC CO.

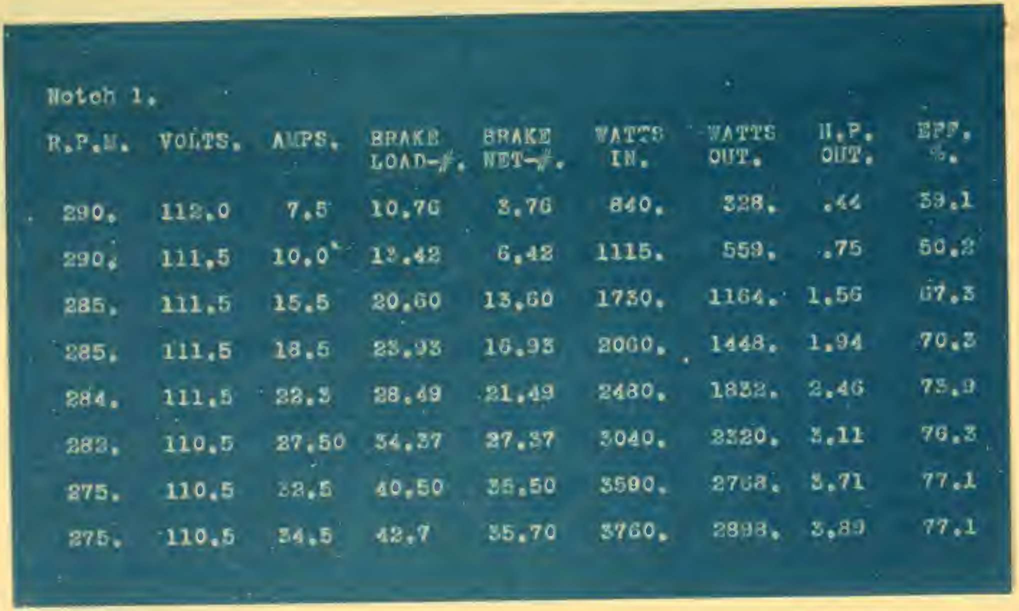
VOLTS-110

NOTCH #11					NOTCH #12				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
1260	1.35	4.56	.41	.0171	1410	1.4	4.38	.23	.0108
1250	2.00	6.63	2.48	.1028	1395	2.0	6.19	2.04	.0944
1250	2.5	8.41	4.26	.1765	1390	2.5	7.69	3.54	.1632
1240	3.0	10.08	5.93	.2438	1390	3.0	9.16	5.01	.2320
1240	3.5	11.53	7.38	.3033	1390	3.5	10.64	6.49	.2990
1240	4.0	12.78	8.63	.3545	1390	4.0	11.71	7.56	.3485
1235	4.5	14.20	10.05	.4120	1385	4.5	12.93	8.78	.4030
1235	5.0	15.36	11.21	.4590	1385	5.0	13.82	9.67	.4440
1225	5.5	16.66	12.51	.5080	1380	5.5	14.82	10.67	.4880
1190	6.0	18.02	13.87	.5475	1380	6.0	15.91	11.76	.5380
1190	6.5	19.12	14.97	.5905	1375	6.5	16.88	12.73	.5800
1180	7.0	21.55	17.40	.6805	1340	7.0	18.40	14.25	.6330



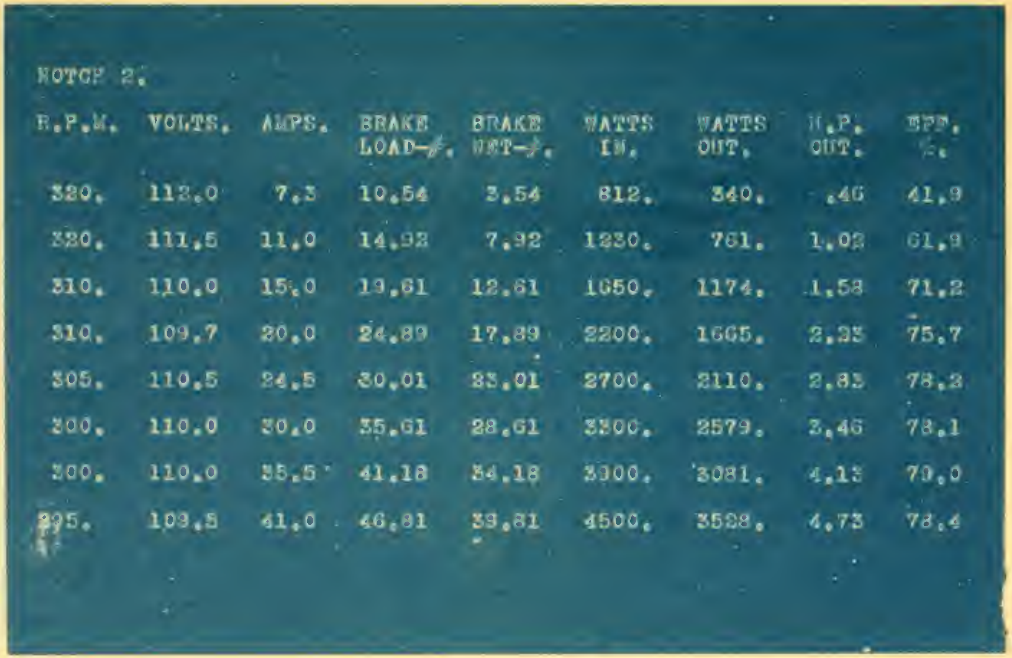
MOTOR CALIBRATION
$\frac{3}{4}$ H.P. MOTOR NO. 15-4112
BUILT BY ELECTRO DYNAMIC CO.
VOLTS-110

NOTCH #13					NOTCH #14				
R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.	R.P.M.	AMPERES INPUT	LOAD TOTAL	LOAD NET	DEV. H.P.
1500	1.45	4.41	.26	.0129	1645	1.45	4.44	.29	.0158
1490	2.0	6.11	1.96	.0968	1630	2.0	5.72	1.57	.0848
1500	2.5	7.62	3.47	.1726	1630	2.5	7.00	2.85	.1540
1500	3.0	8.76	4.61	.2290	1680	3.0	8.13	3.98	.2218
1520	3.5	9.80	5.65	.2850	1665	3.5	9.23	5.08	.2804
1520	4.0	11.15	7.00	.3525	1670	4.0	10.28	6.13	.3390
1510	4.5	12.13	7.98	.3995	1675	4.5	11.02	6.87	.3810
1530	5.0	13.02	8.87	.4500	1710	5.0	11.70	7.55	.4280
1500	5.5	14.07	9.82	.4884	1660	5.5	12.98	8.83	.4860
1500	6.0	14.81	10.66	.5300	1665	6.0	13.70	9.55	.5270
1490	6.5	15.89	11.74	.5800	1690	6.5	14.04	9.89	.5540
1445	7.0	17.16	13.01	.6235	1660	7.0	14.89	10.74	.5910



Notch 1.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
290.	112.0	7.5	10.76	3.76	840.	328.	.44	39.1
290.	111.5	10.0	13.42	6.42	1115.	559.	.75	50.2
285.	111.5	15.5	20.60	13.60	1730.	1164.	1.56	67.3
285.	111.5	18.5	23.93	16.93	2060.	1448.	1.94	70.3
284.	111.5	22.3	28.49	21.49	2480.	1832.	2.46	73.9
283.	110.5	27.50	34.37	27.37	3040.	2320.	3.11	76.3
275.	110.5	32.5	40.50	33.50	3590.	2768.	3.71	77.1
275.	110.5	34.5	42.7	35.70	3760.	2898.	3.89	77.1

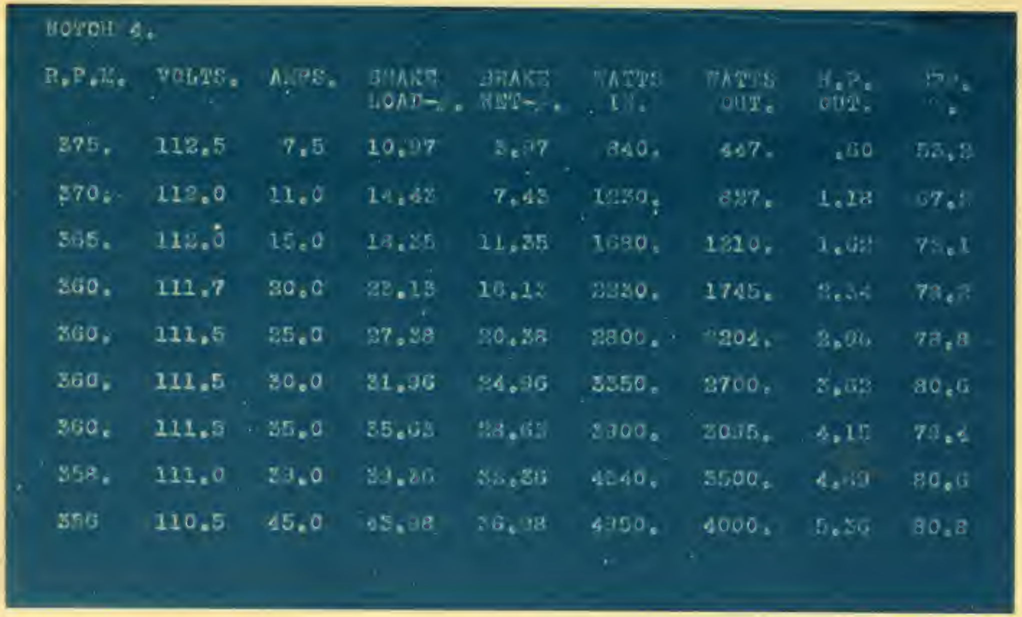


NOTCH 2.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
320.	112.0	7.3	10.54	3.54	812.	340.	.46	41.9
320.	111.5	11.0	14.92	7.92	1230.	761.	1.02	61.9
310.	110.0	15.0	19.61	12.61	1650.	1174.	1.58	71.2
310.	109.7	20.0	24.89	17.89	2200.	1665.	2.23	75.7
305.	110.5	24.5	30.01	23.01	2700.	2110.	2.83	78.2
300.	110.0	30.0	35.61	28.61	3300.	2579.	3.46	78.1
300.	110.0	35.5	41.18	34.18	3900.	3081.	4.13	79.0
295.	109.5	41.0	46.81	39.81	4500.	3528.	4.73	78.4

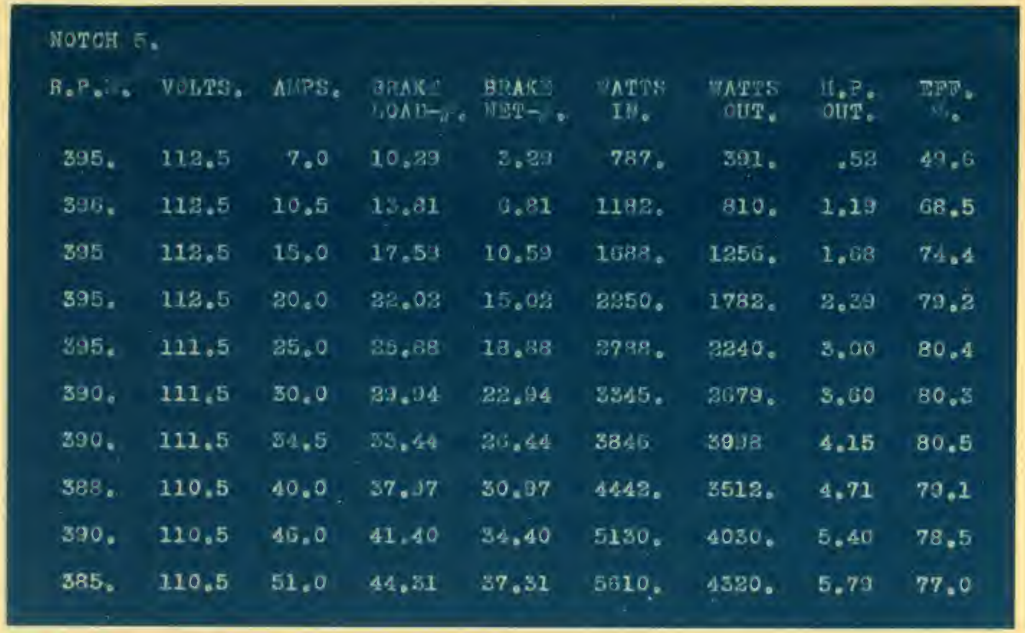
NOTCH 3.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
345.	111.5	7.5	10.80	3.80	835.	407.	.55	48.8
340.	111.0	12.5	16.08	9.08	1390.	927.	1.24	66.7
342.	111.0	16.5	20.66	13.66	1830.	1405.	1.88	76.7
335.	111.5	20.5	24.13	17.13	2250.	1725.	2.31	76.7
330.	110.0	25.0	28.76	21.76	2750.	2156.	2.89	78.5
330.	110.0	30.0	33.45	26.45	3300.	2628.	3.52	79.4
330.	110.5	35.0	38.18	31.18	3850.	3090.	4.14	80.2
330.	110.0	40.0	43.24	36.24	4400.	3592.	4.82	81.7
325.	110.0	45.5	47.53	40.53	5000.	3930.	5.27	78.6



NOTCH 4.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
375.	112.5	7.5	10.97	3.97	840.	467.	.63	55.6
370.	112.0	11.0	14.43	7.43	1230.	827.	1.12	67.2
365.	112.0	15.0	18.35	11.35	1680.	1210.	1.62	72.1
360.	111.7	20.0	23.13	16.13	2230.	1745.	2.34	78.2
360.	111.5	25.0	27.38	20.38	2800.	2204.	2.96	78.8
360.	111.5	30.0	31.96	24.96	3350.	2700.	3.62	80.6
360.	111.5	35.0	35.63	28.63	3900.	3095.	4.15	79.4
358.	111.0	39.0	39.36	32.36	4340.	3500.	4.69	80.6
356	110.5	45.0	43.98	36.98	4950.	4000.	5.36	80.8



NOTCH 5.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
395.	112.5	7.0	10.29	3.29	787.	391.	.52	49.6
396.	112.5	10.5	13.81	6.81	1182.	810.	1.19	68.5
395	112.5	15.0	17.59	10.59	1688.	1256.	1.68	74.4
395.	112.5	20.0	22.02	15.02	2250.	1782.	2.39	79.2
395.	111.5	25.0	25.88	18.88	2788.	2240.	3.00	80.4
390.	111.5	30.0	29.94	22.94	3345.	2679.	3.60	80.3
390.	111.5	34.5	33.44	26.44	3846	3098	4.15	80.5
388.	110.5	40.0	37.37	30.37	4442.	3512.	4.71	79.1
390.	110.5	46.0	41.40	34.40	5130.	4030.	5.40	78.5
385.	110.5	51.0	44.31	37.31	5610.	4320.	5.79	77.0

NOTCH 6.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
420.	112.0	8.5	11.55	4.55	952.	574.	.77	67.4
420.	111.0	11.25	13.78	6.78	1249.	855.	1.15	68.5
420.	111.0	15.0	16.82	9.82	1665.	1239.	1.66	74.4
420.	110.0	20.0	20.54	13.45	2200.	1707.	2.29	77.6
420.	110.5	25.0	24.25	17.25	2763.	2175.	2.92	78.8
418.	110.0	30.5	27.76	20.66	3354.	2606.	3.49	78.8
415.	109.0	35.5	31.27	24.27	3870.	3023.	4.05	78.1
418.	110.0	40.0	34.13	27.13	4400.	3404.	4.57	77.4
418.	109.5	45.4	37.55	30.55	4984.	3836.	5.14	76.9
415.	109.5	50.5	40.76	33.76	5532.	4205.	5.64	76.0

NOTCH 7.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
472.	112.4	8.0	10.51	3.51	899.	498.	.67	55.3
470.	111.5	11.0	12.92	5.92	1226.	835.	1.12	68.1
485.	112.0	15.0	16.00	9.00	1680.	1266.	1.70	75.4
470.	113.5	20.0	19.06	12.06	2270.	1786.	2.39	77.7
462.	113.5	25.0	22.32	15.32	2838.	2215.	2.97	77.1
464.	113.5	30.0	26.28	19.28	3405.	2685.	3.60	78.8
463.	113.0	35.0	29.44	22.44	3955.	3118.	4.18	78.7
461.	113.0	40.5	32.71	25.71	4576.	3560.	4.77	78.8
462.	113.0	45.0	35.34	28.34	5085.	3930	5.28	77.3
462.	112.5	50.0	38.70	31.70	5625.	4325.	5.8	76.9

NOTCH 8.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
514.	115.5	7.5	10.34	3.34	816.	516.	.69	63.6
510.	115.5	11.0	12.70	5.70	1271.	873.	1.17	68.8
508.	114.5	15.0	15.27	8.27	1717.	1262.	1.69	73.5
509.	114.5	20.0	18.71	11.71	2290.	1790.	2.43	78.2
503.	113.5	25.0	21.84	14.84	2838.	2238	3.00	78.9
510.	113.5	30.0	24.70	17.70	3405.	2712.	3.64	79.6
505.	112.5	35.0	27.65	20.65	3938.	3131.	4.20	79.6
505.	112.0	40.0	30.30	23.30	4480.	3535.	4.81	78.9
490.	112.0	45.0	32.93	25.93	5040.	3817.	5.12	75.8
492.	112.0	50.5	35.82	28.82	5655.	4250.	5.71	75.3

NOTCH 9.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
552.	114.0	8.5	10.8	3.8	969.	630.	.85	65.0
545.	113.5	11.5	12.7	5.7	1305.	934.	1.25	71.5
550.	113.5	15.0	14.93	7.93	1703.	1310.	1.76	77.0
550.	113.0	20.5	18.15	11.15	2317.	1843.	2.47	79.6
550.	113.0	25.0	20.62	13.62	2825.	2250.	3.02	79.7
552.	113.0	30.0	23.48	16.48	3390.	2735.	3.67	80.7
550.	113.0	35.0	26.35	19.35	3955.	3200.	4.29	80.9
550.	112.5	40.0	28.86	21.86	4500.	3610.	4.84	80.3
550.	112.0	45.0	31.13	24.13	504 .	3990.	5.34	79.1
540.	111.5	50.0	33.64	26.64	5575.	4325.	5.80	77.8
535.	111.0	55.0	36.02	29.02	6105.	4665	6.25	76.4
530.	110.5	60.0	38.24	31,24	6630.	4965.	6.66	74.9
520.	110.5	65.0	40.43	33.43	7182.	5061.	6.79	70.5
512.	110.0	70.0	42.58	35.58	7700.	5470.	7.34	71.0

NOTCH 10.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
610.	113.0	9.5	10.83	3.83	1074.	702.	.94	65.4
605.	112.5	11.3	12.35	5.35	1276.	1005.	1.35	78.8
600.	112.5	15.0	14.12	7.12	1688.	1274.	1.72	76.5
605.	112.0	20.0	16.78	9.78	2240.	1778.	2.38	79.4
605.	112.0	25.0	19.30	12.30	2800.	2238.	3.00	79.9
610.	111.5	30.0	21.61	14.61	3345.	2680.	3.59	80.1
610.	111.5	35.0	24.11	17.11	3903.	3140.	4.20	80.3
607.	111.5	40.0	26.30	19.30	4460.	3520.	4.72	79.0
600.	111.0	45.0	28.60	21.60	4995.	3890.	5.22	77.9
600.	110.5	50.5	30.72	23.72	5525.	4280.	5.73	77.4
593.	110.5	55.0	32.68	25.68	6078.	4570.	6.13	75.3
590.	110.3	60.0	35.00	28.00	6618.	4965.	6.66	75.0
575.	110.0	65.0	37.12	30.12	7150.	5200.	6.97	72.7
552.	109.5	72.0	39.62	32.62	7884.	5400.	7.24	68.5

NOTCH 11.

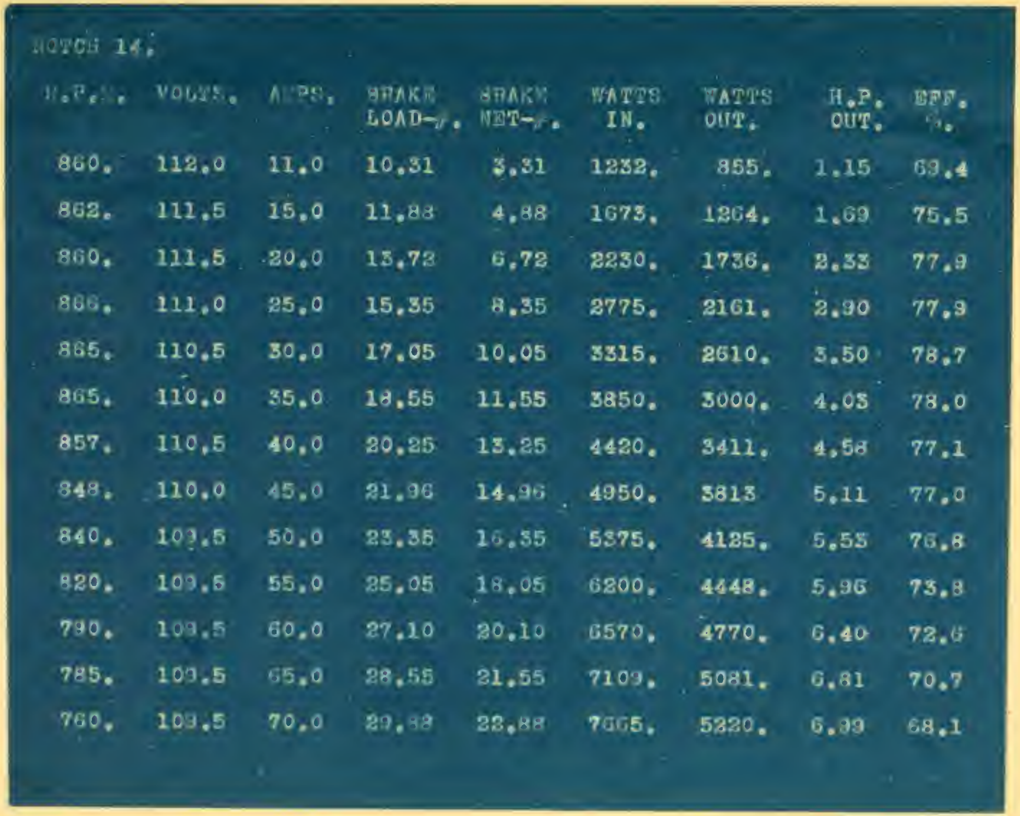
R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS. IN.	WATTS OUT.	H.P. OUT.	EFF. %.
670.	113.5	9.2	10.44	3.44	1049.	693.	.93	66.0
670.	113.5	12.0	11.86	4.86	1362.	978.	1.31	71.8
666.	113.5	15.0	13.35	6.35	1703.	1268.	1.70	74.5
671.	112.5	20.0	15.78	8.78	2250.	1770.	2.37	78.6
672.	112.5	25.0	18.18	11.18	2813.	2260.	3.03	80.3
670.	112.0	30.0	20.65	13.65	3360.	2750.	3.69	81.8
674.	111.5	35.0	22.43	15.43	3903.	3110.	4.16	79.6
662.	111.0	40.0	24.78	17.78	4440.	3540.	4.78	79.6
662.	110.5	45.0	26.62	19.62	4973.	3900.	5.22	78.6
650.	110.5	50.0	28.50	21.50	5525.	4235.	5.68	76.7
640.	110.0	55.0	30.60	23.60	6050.	4570.	6.12	75.6
630.	109.5	60.0	32.47	25.47	6570.	4822.	6.46	73.4
615.	109.5	65.0	34.60	27.60	7117.	5095.	6.83	71.7
605.	109.0	70.5	37.02	30.02	7685.	5450.	7.31	71.0

NOTCH 12.

R.P.M.	VOLTS	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
733.	112.0	10.0	10.50	3.50	1120.	770.	1.03	68.7
752.	111.5	15.0	12.49	5.49	1673.	1206.	1.62	72.2
732.	111.5	20.0	14.38	7.38	2230.	1756.	2.35	78.8
730.	111.0	25.0	17.00	10.00	2775.	2410.	3.23	86.9
722.	110.5	30.0	19.10	12.10	3315.	2660.	3.56	80.3
725.	110.0	35.0	20.35	13.35	3850.	3075.	4.12	79.8
728.	110.0	40.0	22.88	15.88	4400.	3475.	4.66	79.0
724.	109.8	45.0	24.66	17.66	4941.	3845.	5.15	77.8
720.	110.5	50.0	26.30	19.30	5525.	4175.	5.60	75.6
718.	109.5	55.0	28.70	21.70	6023.	4680.	6.27	77.7
700.	109.0	60.0	30.00	23.00	6540.	4835.	6.84	74.0
675.	108.5	65.0	31.82	24.82	7053.	5030.	6.74	71.3
670.	108.5	70.0	33.75	26.75	7595.	5380.	7.21	70.9

NOTCH 13.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %
790.	111.5	10.5	10.43	3.43	1171.	814.	1.09	[illegible]
795.	111.5	15.0	12.34	5.34	1673.	1252.	1.68	74.8
695.	111.5	20.0	14.24	7.24	2230.	1729.	2.33	77.5
795.	111.0	25.0	16.30	9.30	2775.	2220.	2.98	80.0
795.	110.5	30.0	18.00	11.00	3315.	2627.	3.52	[illegible]
793.	110.5	35.0	20.00	13.00	3868.	3096.	4.15	80.0
790.	110.5	40.5	21.67	14.67	4475.	3484.	4.67	77.9
780.	110.0	45.0	23.35	16.35	4950.	3829.	5.34	77.4
785.	109.5	50.0	25.21	18.21	5475.	4184.	5.61	76.5
750.	108.5	55.0	26.72	19.72	6225.	4445.	5.96	71.4
740.	108.5	60.0	28.78	21.78	6570.	4841.	6.49	[illegible]
715.	109.0	65.0	30.56	23.56	7085.	5061.	6.78	71.5
720.	108.5	71.5	31.16	24.16	7760.	[illegible]	7.06	[illegible]



NOTCH 14.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
860.	112.0	11.0	10.31	3.31	1232.	855.	1.15	69.4
862.	111.5	15.0	11.88	4.88	1673.	1264.	1.69	75.5
860.	111.5	20.0	13.72	6.72	2230.	1736.	2.33	77.9
866.	111.0	25.0	15.35	8.35	2775.	2161.	2.90	77.9
865.	110.5	30.0	17.05	10.05	3315.	2610.	3.50	78.7
865.	110.0	35.0	18.55	11.55	3850.	3000.	4.03	78.0
857.	110.5	40.0	20.25	13.25	4420.	3411.	4.58	77.1
848.	110.0	45.0	21.96	14.96	4950.	3813	5.11	77.0
840.	109.5	50.0	23.35	16.35	5375.	4125.	5.53	76.8
820.	109.5	55.0	25.05	18.05	6200.	4448.	5.96	73.8
790.	109.5	60.0	27.10	20.10	6570.	4770.	6.40	72.6
785.	109.5	65.0	28.55	21.55	7109.	5081.	6.81	70.7
760.	109.5	70.0	29.88	22.88	7665.	5220.	6.99	68.1

NOTCH 15.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
920.	112.5	11.5	10.14	3.14	1227.	868.	1.16	70.2
920.	111.5	15.0	11.48	4.48	1688.	1248.	1.67	73.8
925.	111.5	20.0	13.11	6.11	2230.	1696.	2.28	76.0
925.	111.5	25.0	14.82	7.82	2788.	2173.	2.93	78.0
925.	111.5	30.0	16.36	9.36	3345.	2600.	3.49	77.7
925.	111.0	35.0	17.86	10.86	3885.	3019.	4.05	77.7
919.	111.0	40.0	19.65	12.65	4440.	3490.	4.68	78.6
900.	111.5	45.0	21.25	14.25	5019	3855.	5.17	76.8
885.	110.5	50.0	22.67	15.67	5525.	4165.	5.58	75.4
862.	110.5	55.0	24.34	17.34	6078.	4495.	6.02	74.0
835.	110.0	60.0	25.85	18.85	6600.	4725.	6.34	71.7
825.	109.5	65.0	27.22	20.22	7117.	5030.	6.75	70.6
790.	109.5	70.0	29.02	22.02	7665.	5230.	7.02	68.3

MOTOR 10.

R.P.M.	VOLTS.	AMPS.	BRAKE ADJ.	BRAKE NET.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %
1000.	112.0	11.5	10.11	3.11	1288.	934.	1.25	72.5
1000.	112.0	15.0	11.10	4.10	1680.	1253.	1.68	74.6
1000.	111.5	20.0	12.04	5.04	2230.	1694.	2.27	76.0
1000.	111.0	25.0	14.12	7.12	2775	2139.	2.87	77.1
1000.	110.5	30.0	16.47	9.47	3315.	2545.	3.41	76.7
1000.	110.5	35.5	16.80	9.80	3867.	2942.	3.94	76.3
990.	110.0	40.0	18.48	11.48	4400.	3415.	4.57	77.6
965.	110.0	45.0	19.48	12.48	4950.	3762.	5.04	76.0
940.	109.5	50.0	21.47	14.47	5475.	4090.	5.48	74.7
915.	109.5	55.5	23.13	16.13	6085.	4423.	5.94	72.7
888.	109.5	60.0	24.67	17.67	6570.	4680.	6.28	71.2
840.	109.0	65.0	26.04	19.04	7085.	4805.	6.44	67.8
825.	108.5	70.0	27.88	20.88	7595.	5170.	6.94	68.1

MOTOR 17.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS. IN.	WATTS OUT.	H.P. OUT.	EFF. %.
1050.	111.5	11.5	9.84	2.84	1282.	896.	1.20	69.9
1050.	111.5	15.0	10.91	3.91	1672.	1232.	1.65	73.7
1050.	111.0	20.0	12.37	5.37	2220.	1695.	2.27	76.3
1070.	111.0	25.0	13.71	6.71	2775.	2155.	2.89	77.7
1075.	111.5	30.0	14.91	7.91	3345.	2555.	3.43	76.4
1075.	111.0	35.0	16.50	9.50	3885.	3067.	4.11	78.9
1065.	110.5	40.0	17.85	10.85	4420.	3470.	4.65	78.5
1050.	109.5	45.0	18.96	11.96	4928.	3772.	5.06	76.5
1025.	110.0	50.0	20.27	13.27	5500.	4080.	5.47	74.2
975.	110.0	55.0	22.29	15.29	6050.	4480.	6.00	74.0
940.	109.5	60.0	23.80	16.80	6575.	4745.	6.36	72.2
900.	109.5	65.0	25.50	18.50	7118.	5000.	6.71	70.3
900.	109.0	70.0	25.46	18.46	7740.	5160.	6.92	66.7

NOTCH 18.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
1165.	111.5	13.0	10.13	3.13	1450.	1095.	1.47	75.5
1160.	111.5	15.0	10.37	3.37	1673.	1180.	1.58	70.5
1170.	111.5	20.0	11.68	4.68	2230.	1645.	2.20	73.8
1185.	111.0	25.0	12.87	5.87	2775.	2090.	2.80	75.3
1180.	110.5	30.0	14.20	7.20	3315.	2550.	3.42	76.9
1155.	110.5	35.0	15.51	8.51	3867.	2952.	3.96	76.4
1145.	110.0	40.0	16.80	9.80	4400.	3370.	4.52	76.6
1135.	109.5	45.0	17.70	10.70	4928.	3650.	4.89	74.1
1100.	109.5	50.0	19.21	12.21	5475.	4075.	5.41	73.8
1055.	109.0	55.0	20.72	13.72	5995.	4340.	5.82	72.4
1030.	108.5	60.0	22.26	15.26	6510.	4678.	6.72	

NOTCH 19.

R.P.M.	VOLTS.	AMPS.	BRAKE LOAD—#.	BRAKE NET—#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
1350.	111.0	14.0	10.25	3.25	1554.	1217.	1.64	78.3
1350.	110.5	17.0	10.12	5.80	1878.	1282.	1.72	68.3
1340.	110.5	20.0	11.6	4.00	2210.	1715.	2.30.	77.5
1340.	110.0	25.0	12.50	55.50	2750.	2050.	2.75	74.5
1340.	110.0	30.0	13.52	6.52	3300.	2480.	3.36	75.5
1340.	109.5	35.0	14.65	7.65	3835.	2850.	3.82	74.3
1330.	109.5	40.0	15.73	8.73	4380.	3232.	4.34	73.8
1190.	109.0	45.0	17.00	10.00	4905.	3572.	4.79	72.9
1160.	109.0	50.0	18.20	11.20	5450.	3870.	5.19	71.0
1120.	108.5	55.0	19.72	12.72	5968.	4204.	5.64	70.4
1070.	108.5	60.0	21.31	14.31	6510.	4600.	6.17	70.7
1100.	108.0	65.0	21.00	14.00	7020.	4880.	6.54	69.5
1040.	107.5	70.0	22.67	15.67	7525.	4900.	6.56	65.0

NOTCH 20.

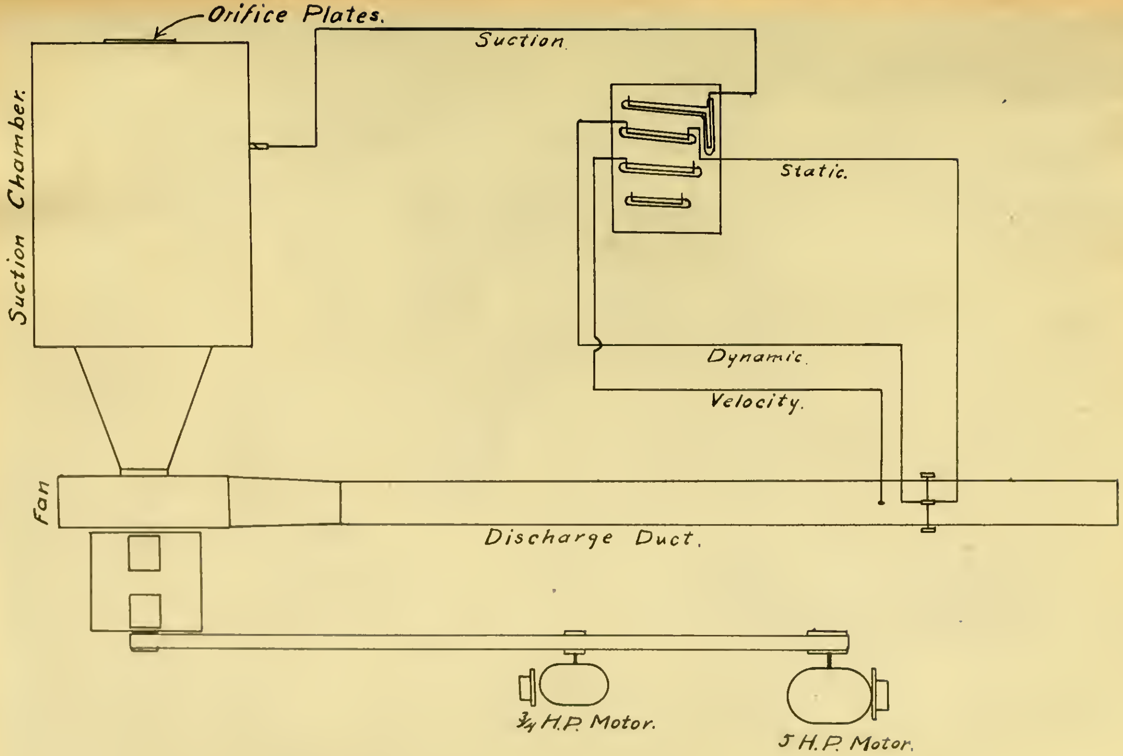
R.P.M.	VOLTS.	AMPS.	BRAKE LOAD—#.	BRAKE NET—#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
1300.	111.0	15.0	9.68	2.68	1665.	1046.	1.40	62.9
1310.	113.0	20.0	11.00	4.00	2260.	1574.	2.11	69.6
1310.	113.0	25.0	12.20	5.20	2825.	2046.	2.74	72.4
1215.	112.5	30.0	12.86	5.86	3375.	2316.	3.10	68.6
1260.	113.0	35.0	14.02	7.02	3950.	2885.	3.86	73.1
1210.	112.0	40.0	15.30	8.30	4480.	3265.	4.38	72.9
1230.	112.0	45.0	16.42	9.42	5040.	3620.	4.86	71.8
1200.	112.0	50.0	17.98	10.98	5600.	3960.	5.31	70.7
1180.	111.0	55.0	19.46	12.46	6105.	4416.	5.92	72.3
1165.	111.5	60.0	20.56	13.56	6690.	4780.	6.41	71.5
1115.	111.0	65.0	21.82	14.82	7215.	4965.	6.65	68.8
1155.	111.0	70.0	22.77	15.77	7770.	5230.	7.01	67.4

TABLE 21.

R.P.M.	AMPS.	VOLTS.	BRAKE LOAD-#.	BRAKE NET-#.	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
1510.	25.0	113.5	11.60	4.60	2840.	2087.	2.80	73.4
1485.	30.0	113.0	12.44	5.44	3390.	2443.	3.28	72.0
1450.	35.0	113.0	13.63	6.63	3955.	2880.	3.87	73.0
1370.	40.0	113.0	14.95	7.95	4520.	3270.	4.39	72.3
1350.	45.0	112.5	15.98	8.98	5060.	3617.	4.85	71.4
1320.	50.0	111.5	17.80	10.80	5580.	4045.	5.42	72.5
1310.	55.0	112.0	17.78	10.78	6160.	4220.	5.66	68.5
1250.	60.0	112.0	18.85	11.85	6720.	4445.	5.96	66.1
1230.	65.0	111.5	19.67	12.67	7250.	4640.	6.22	64.0
1200.	70.0	111.0	20.60	13.60	7175	4900.	6.57	63.1

POINTS FOR CHARACTERISTIC CURVE.

R.P.M.	VOLTS.	AMPS.	BRAKE CAP—	BRAKE NET—	WATTS IN.	WATTS OUT.	H.P. OUT.	EFF. %.
272.	30.0	113.5	38.50	31.50	3404.	2572.	3.45	75.6
295.	30.0	113.5	36.75	29.75	3404.	2635.	3.53	77.4
320.	30.0	113.5	34.81	27.81	3404.	2672.	3.58	78.5
350.	30.0	113.5	32.90	25.90	3404.	2720.	3.65	79.7
380.	30.0	113.0	30.98	23.98	3390.	2736.	3.67	80.6
410.	30.0	113.0	28.54	21.54	3390.	2656.	3.56	78.3
460.	30.0	114.0	26.54	19.54	3420.	2698.	3.61	78.8
500.	30.0	113.5	24.90	17.90	3404.	2684.	3.60	78.8
550.	30.0	113.0	23.45	16.45	3390.	2715.	3.64	80.1
605.	30.0	113.5	21.97	14.97	3404.	2718.	3.64	79.8
665.	30.0	113.5	20.63	13.63	3404.	2721.	3.65	80.0
730.	30.0	113.5	19.48	12.48	3404.	2734.	3.67	80.3
780.	30.0	112.5	18.41	11.41	3374.	2672.	3.58	79.2
864.	30.0	114.0	17.54	10.54	3420.	2734.	3.67	79.9
930.	30.0	114.0	16.67	9.67	3420.	2700.	3.62	78.9
995.	30.0	114.0	15.91	8.91	3420.	2661.	3.57	77.8
1075.	30.0	114.0	15.37	8.37	3420.	2700.	3.62	78.9
1170.	30.0	114.0	14.50	7.50	3420.	2634.	3.53	77.0
1240.	30.0	112.5	13.94	6.94	3404.	2588.	3.47	75.9
1350.	30.0	113.5	13.50	6.50	3404.	2635.	3.53	77.4



Plan View of Apparatus.

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	11	DATE	2-11-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %	38
WIDTH-RUNNER INCHES.	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.51
NUMBER OF VANES.	6	WET BULB 52° DRY BULB	62°	PULLEY RATIO.	0.655

N	M	B	P_h	E	I	W	S	P	V	S_a
3	450	295	30.9	110	2.15	237.	0.149	0.000	0.030	10.58
4	540	354	37.0		2.35	259	.223	.000	.050	15.83
5	620	406	42.5		2.65	292	.300	.002	.073	21.30
6	705	462	48.5		3.05	33.6	.390	.002	.098	27.69
7	775	508	53.2		3.60	396	.500	.004	.130	35.50
8	895	586	61.3		4.45	489	.650	.009	.170	46.15
9	965	632	66.2		5.25	578	.749	.011	.203	53.20
10	1050	688	72.0		6.40	704	.890	.013	.243	63.19
11	1110	727	76.1	110	7.50	825	0.990	0.015	0.270	70.30

REMARKS —

VENTURI NOZZLE REMOVED FROM DISCHARGE

AREA OF DUCT 0.7854 SQ.FT.

MOTOR #15-4112

H.P. 3/4

P_A	V_A	V_O	H_A	V_S	C_E	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.000		2.13	12.71	11.71	9.19	.672	0.135	0.0155	43.0	11.48
.000		3.62	19.45	15.26	12.76	.932	.177	.0330	45.8	18.64
.142		5.18	26.62	18.27	14.34	1.064	.230	.0506	47.5	22.00
.142		6.96	34.79	21.30	16.72	1.221	.279	.0773	48.0	27.70
.284		9.23	45.01	24.37	19.13	1.397	.339	.1143	51.2	33.70
.639		12.07	58.86	27.36	21.48	1.567	.440	.1677	50.5	38.10
.781		14.42	68.40	30.47	23.91	1.746	.520	.2171	50.3	41.70
.923		17.25	81.36	33.30	26.13	1.909	.617	.2837	50.6	46.00
1.065		19.17	90.54	35.12	27.56	2.012	0.	0.3315	50.4	

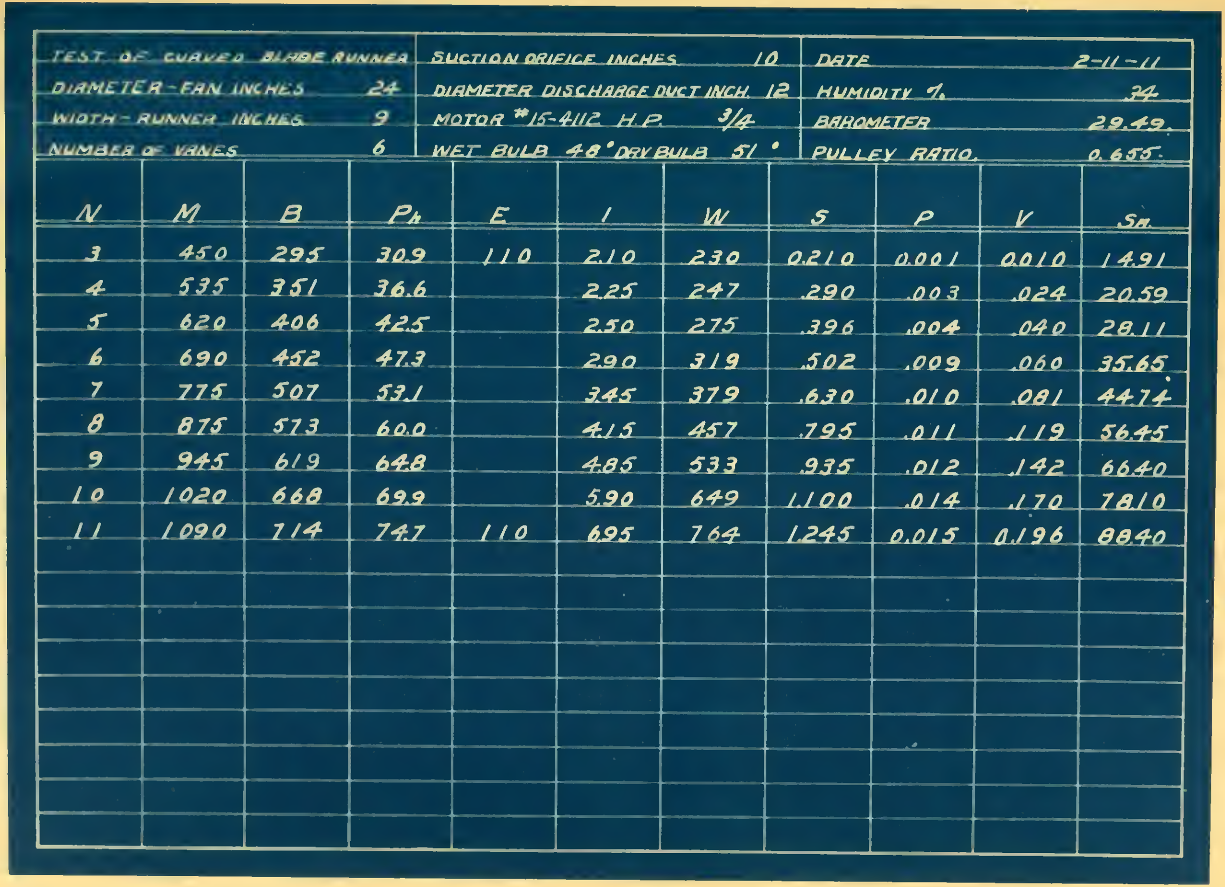
TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	11	DATE	2-11-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %	38
WIDTH - RUNNER INCHES.	9	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.51
NUMBER OF VANES.	6	WET BULB 52° DRY BULB	62°	PULLEY RATIO.	1.458

N	M	B	P_a	E	I	W	S	P	V	S_a
5	390	569	59.5	110	6.3	693	.635	0.010	0.167	45.1
6	420	613	64.2		7.0	770	.740	.012	.195	52.6
7	470	686	71.8		7.5	825	.890	.015	.222	63.2
8	505	737	77.1		8.5	941	1.060	.020	.290	75.3
9	560	817	85.5		9.5	1045	1.280	.023	.346	90.9
10	615	897	93.9		11.5	1265	1.566	.030	.440	111.2
11	670	978	102.3		13.5	1485	1.855	.032	.510	131.7
12	725	1057	110.6		16.0	1760	2.220	.040	.615	157.6
13	790	1162	121.6		19.7	2167	2.655	.049	.740	188.5
14	875	1287	134.7		26.0	2860	3.250	.055	.865	230.9
15	945	1379	145.5		34.4	3785	3.800	.065	1.040	269.8
16	1010	1474	154.4		38.0	4180	4.150	.074	1.120	294.6
17	1045	1525	159.6	110	42.7	4690	4.500	0.080	1.240	319.5

REMARKS —
VENTURI NOZZLE REMOVED FROM DISCHARGE.
AREA DISCHARGE DUCT 0.7854

MOTOR # 5-S-3976
H.P. 5

PA	VA	VD	HA	VS	CE	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
.71		11.85	57.66	27.72	21.76	1.588	0.423	0.167	52.4	39.4
.85		13.84	67.24	29.84	23.41	1.709	.545	.210	52.5	38.5
1.07		15.76	80.02	31.84	25.00	1.825	.620	.266	50.0	42.9
1.42		20.59	91.26	36.90	28.95	2.113	.785	.374	52.7	47.6
1.63		24.50	117.03	39.70	31.15	2.275	.935	.484	51.6	51.8
2.13		31.24	144.52	44.80	35.16	2.566	1.220	.675	52.8	55.3
2.27		36.20	170.17	48.23	37.88	2.765	1.485	.856	52.4	57.6
2.84		43.65	204.09	52.98	41.59	3.036	1.835	1.127	53.7	61.5
3.48		52.50	244.48	58.10	45.60	3.330	2.270	1.480	53.2	62.2
3.91		61.40	296.21	62.80	49.30	3.600	3.025	1.940	52.6	64.2
4.61		73.85	348.26	68.90	54.10	3.950	2	2.500	53.0	63.7
5.25		79.55	379.40	71.58	56.90	4.150	4.270	2.865	51.3	67.1
5.68		88.00	413.18	75.12	59.06	4.310	4.740	3.240	52.2	68.4



TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES	10	DATE	2-11-11
DIAMETER-FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %	34
WIDTH-RUNNER INCHES	9	MOTOR #15-4112 H.P.	3/4	BAROMETER	29.49.
NUMBER OF VANES	6	WET BULB 48° DRY BULB	51°	PULLEY RATIO.	0.655.

N	M	B	Ph	E	I	W	S	P	V	Sa.
3	450	295	30.9	110	2.10	230	0.210	0.001	0.010	14.91
4	535	351	36.6		2.25	247	.290	.003	.024	20.59
5	620	406	42.5		2.50	275	.396	.004	.040	28.11
6	690	452	47.3		2.90	319	.502	.009	.060	35.65
7	775	507	53.1		3.45	379	.630	.010	.081	44.74
8	875	573	60.0		4.15	457	.795	.011	.119	56.45
9	945	619	64.8		4.85	533	.935	.012	.142	66.40
10	1020	668	69.9		5.90	649	1.100	.014	.170	78.10
11	1090	714	74.7	110	6.95	764	1.245	0.015	0.196	88.40

REMARKS-

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT.

AREA OF DUCT 0.7854 sq. FT.

MOTOR 15-4112

H.P. 1/4

Pa	Va	Vo	Ha	Vf	Cf	#/sec.	H.P. in.	H.P. out.	M.E %	EFF %
0.071		.71	15.69	6.76	5.31	0.307	0.127	0.0111	52.9	8.7
.213		1.70	22.51	10.48	8.23	.601	.165	.0246	54.1	14.9
.284		2.84	31.23	13.52	10.56	.775	.210	.0441	55.7	21.0
.639		4.26	40.55	16.55	12.98	.948	.262	.0695	58.3	26.5
.710		5.75	51.20	19.24	15.10	1.103	.323	.1026	58.5	31.8
.781		8.45	65.69	23.31	18.30	1.336	.406	.1595	58.8	39.3
.852		10.08	77.33	25.48	20.80	1.460	.480	.2052	59.3	42.7
.994		12.07	91.16	27.87	21.88	1.596	.572	.2648	60.1	46.3
1.065		13.92	103.39	29.90	23.48	1.713	0.627	.3220	59.6	51.4

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES	10	DATE	2-11-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %.	34
WIDTH - RUNNER INCHES.	9	MOTOR #5-S-3976 H. P.	5	BAROMETER	29.49
NUMBER OF VANES.	6	WET BULB 48° DRY BULB	51	PULLEY RATIO.	1.458

N	M	B	P_b	E	I	W	S	P	V	S_a
5	390	569	59.5	110	6.0	660	.820	0.010	0.126	58.2
6	420	613	64.2		6.7	737	.985	.012	.155	69.9
7	470	686	71.8		7.2	792	1.185	.015	.190	84.2
8	510	744	78.9		8.3	913	1.415	.020	.225	100.4
9	570	832	87.1		9.5	1045	1.675	.023	.275	118.9
10	620	904	94.6		11.3	1243	2.045	.026	.333	145.2
11	680	992	103.8		13.3	1463	2.450	.030	.410	174.0
12	730	1075	112.5		16.0	1760	2.930	.034	.484	208.0
13	795	1165	122.0		19.0	2190	3.450	.039	.565	244.9
14	875	1287	134.7		23.7	2607	4.100	.045	.680	291.0
15	945	1390	144.5		30.5	3355	4.770	.055	.807	338.6
16	1000	1458	152.6		36.5	3960	5.300	.060	.892	376.2
17	1050	1532	164.0		42.5	4590	5.750	.065	.985	408.3
18	1090	1590	166.4	110	49.0	5290	6.250	0.070	1.060	443.9

REMARKS-

VENTURI NOZZLE REMOVED FROM DISCHARGE

AREA OF DUCT 0.7854 SQ. FT.

MOTOR # 5-S-3976

H.P. 5

P_a	V_a	V_o	H_a	V_s	C_f	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
.710		8.95	67.86	24.01	18.84	1.375	0.375	0.170	61.7	45.3
.852		11.00	81.75	26.60	20.88	1.524	.505	.226	63.9	44.9
1.065		13.49	98.74	29.48	23.10	1.687	.575	.303	61.7	52.6
1.420		15.97	117.79	32.03	25.15	1.835	.755	.393	61.0	52.1
1.633		19.52	140.05	35.41	27.81	2.031	.955	.519	59.4	54.3
1.846		23.64	170.69	39.00	30.94	2.232	1.195	.693	61.4	58.0
2.130		29.11	205.24	43.25	33.95	2.480	1.465	.923	61.3	63.1
2.414		34.36	244.77	47.00	36.90	2.692	1.840	1.198	62.2	65.1
2.769		40.10	287.77	50.80	39.85	2.910	2.295	1.552	62.4	67.7
3.195		48.25	342.45	55.70	43.70	3.190	2.750	1.988	61.4	72.3
3.905		57.30	399.81	60.70	47.65	3.480	3.485	2.530	60.8	72.6
4.260		63.30	443.76	63.80	50.10	3.660	4.055	2.951	61.3	72.8
4.614		69.94	482.85	67.10	52.70	3.845	4.640	3.375	57.9	72.7
4.970		75.25	524.12	69.60	54.65	3.990	5.250	3.800	60.8	72.4

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	9	DATE	2-11-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %	47
WIDTH-RUNNER INCHES.	9	MOTOR #15-4112 H.P.	3/4	BAROMETER	29.70
NUMBER OF VANES.	6	WET BULB 54° DRYBULB	64°	PULLEY RATIO.	0.655

N	M	B	Ph	E	I	W	S	P	V	Sa
3	440	289	30.2	110	2.10	231	0.240	0.001	0.006	17.0
4	530	347	36.3		2.30	253	.330	.002	.016	23.4
5	620	406	42.5		2.55	281	.445	.002	.030	31.6
6	695	455	47.6		2.95	325	.590	.002	.046	41.9
7	780	511	53.5		3.45	380	.744	.003	.063	52.8
8	870	570	59.7		4.17	459	.920	.005	.085	65.3
9	960	629	65.9		5.00	550	1.095	.006	.113	77.8
10	1050	688	72.1		5.95	6.54	1.290	.007	.135	91.6
11	1115	731	76.5	110	7.15	786	1.490	0.009	0.164	105.8

REMARKS–

VENTURI NOZZLE REMOVED FROM DISCHARGE

AREA OF DUCT 0.7854 SQ.FT

MOTOR #15-4112

H.P. 3/4

Pa	Vd	Vb	Ha	Vf	Cf	#/sec	H.P. in.	H.P. out	M.E. %	EFF. %
0.011	.426		17.54	5.24	4.11	0.300	0.127	0.0096	61.9	7.54
.142	1.136		24.71	8.55	6.71	.490	.172	.0207	60.4	12.04
.142	2.130		33.87	11.71	9.19	.671	.218	.0413	60.4	18.95
.142	3.265		45.31	14.50	11.38	.831	.268	.0685	64.4	25.54
.213	4.475		57.49	16.96	13.31	.972	.324	.1015	64.7	31.35
.355	6.035		71.70	19.70	15.46	1.129	.410	.1472	64.8	35.90
.426	8.250		86.43	23.05	18.08	1.320	.495	.2075	64.1	41.90
.497	9.582		101.68	24.83	19.50	1.424	.576	.2635	63.0	45.80
0.639	11.640		118.08	27.38	21.50	1.570		0.3369	65.0	

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES	9	DATE	3-10-11
DIAMETER - FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	42.
WIDTH - RUNNER INCHES	9	MOTOR # 5-S-3976 H.P.	5	BAROMETER	29.45
NUMBER OF VANES	6	WET BULB 62° DRY BULB	77°	PULLEY RATIO	1.458

N	M	B	P_h	E	I	W	S	P	V	Sa.
5	375	547	57.3	110	5.5	604	0.680	0.009	0.091	48.3
6	415	605	63.4		5.8	637	.805	.011	.110	57.2
7	455	664	69.6		6.4	704	.970	.012	.133	68.9
8	495	722	75.7		7.0	770	1.125	.015	.155	79.9
9	535	781	81.9		7.8	858	1.350	.018	.189	95.9
10	595	868	91.0		9.2	1012	1.655	.022	.230	117.5
11	655	955	100.2		10.7	1177	1.935	.025	.266	137.4
12	715	1043	109.4		13.0	1430	2.330	.029	.323	165.5
13	775	1131	118.6		14.7	1617	2.695	.035	.370	191.4
14	845	1232	129.1		18.2	2000	3.290	.041	.446	233.5
15	930	1356	142.2		22.5	2475	3.860	.049	.533	274.0
16	1005	1466	153.6		28.0	3080	4.390	.056	.609	311.7
17	1065	1554	163.0		33.2	3650	4.950	.063	.681	353.0
18	1135	1656	173.6		40.0	4400	5.720	.069	.785	406.0
19	1180	1722	180.5		46.3	5090	6.050	.076	.834	429.5
20	1220	1780	186.6		50.5	5555	6.550	.081	.900	465.0
21	1240	1810	189.8	110	54.5	6000	6.720	0.082	.925	477.0

REMARKS-

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT.

AREA OF DUCT 0.7854 SQ. FT.

MOTOR #-5-S-3976

H.P. 5

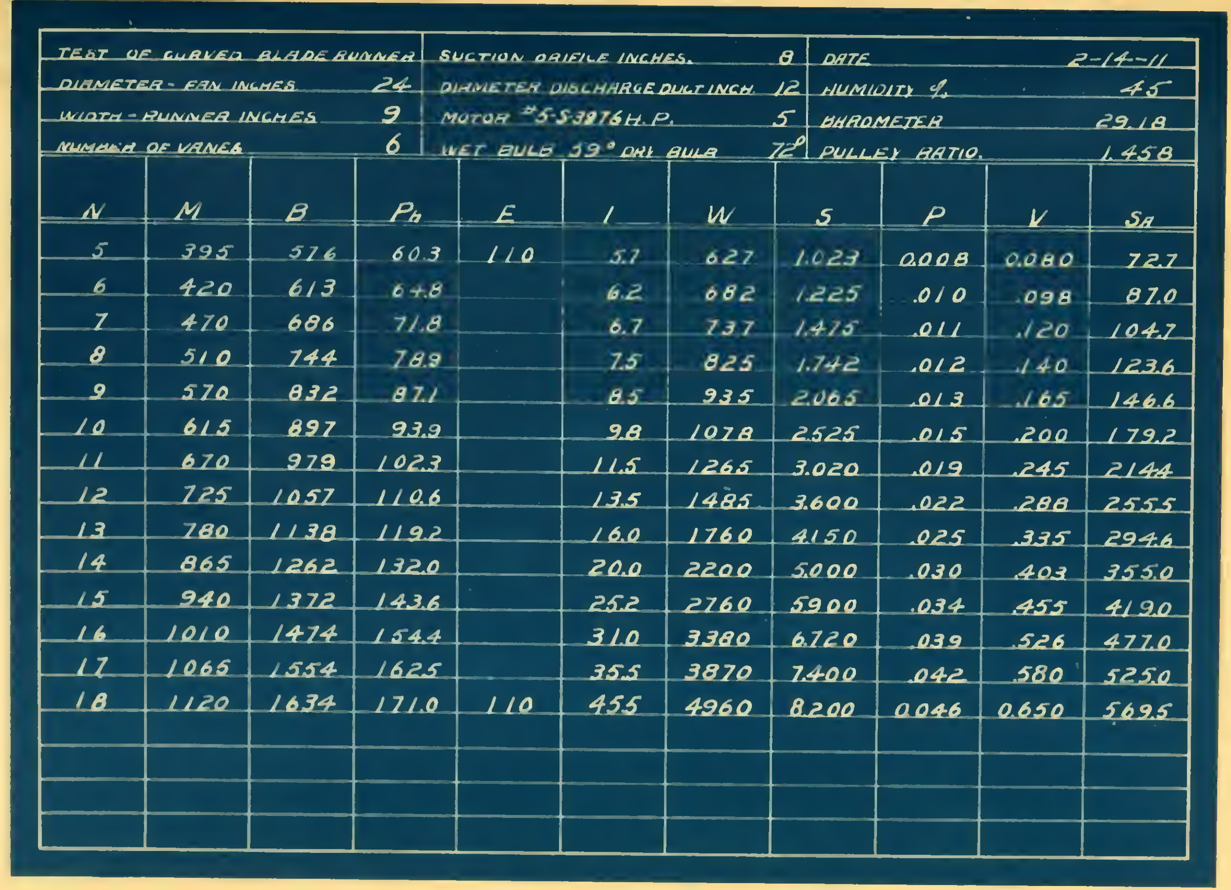
P_a	V_a	V_o	H_a	V_s	C_F	#/SEC.	H.P. IN	H.P. OUT	M.E. %	EFF. %
0.639		6.46	55.39	20.39	16.00	1.167	0.295	0.1185	54.5	40.17
.781		7.81	65.74	22.42	17.59	1.284	.375	.1536	52.6	40.95
.852		9.45	79.15	24.65	19.36	1.413	.460	.2034	52.6	44.20
1.065		11.01	91.98	26.62	20.90	1.526	.570	.2551	51.7	44.80
1.278		13.42	110.70	29.38	23.05	1.683	.695	.3388	53.2	48.75
1.562		15.62	134.68	31.68	24.87	1.816	.910	.4445	51.5	48.90
1.775		17.75	156.93	33.78	26.52	1.936	1.115	.5525	50.3	49.55
2.060		22.94	190.50	38.40	30.15	2.207	1.440	.7622	50.3	52.90
2.485		26.28	220.17	41.13	32.28	2.357	1.625	.9430	54.5	58.05
2.911		31.61	258.02	45.10	35.40	2.583	2.180	1.2120	49.9	55.60
3.480		37.85	315.33	49.30	38.69	2.822	2.550	1.6190	50.2	63.50
3.975		43.25	358.93	52.74	41.38	3.020	3.175	1.9690	49.0	62.10
4.475		48.35	405.83	55.78	43.78	3.195	3.725	2.3580	49.2	63.30
4.900		55.75	466.65	59.88	47.00	3.432	4.425	2.9100	49.9	65.80
5.395		58.91	493.81	61.55	48.30	3.525	4.990	3.1640	49.1	63.40
5.750		63.90	534.65	64.10	50.35	3.675	5.310	3.5750	48.8	67.30
5.825		65.70	548.53	65.00	51.02	3.725	5.510	3.7150	49.5	66.70

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES	8	DATE	2-14-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	45
WIDTH - RUNNER INCHES.	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.18
NUMBER OF VANES.	6	WET BULB 59° DRY BULB	72°	PULLEY RATIO.	0.655

N	M	B	P_h	E	I	W	S	P	V	S_a
4	545	357	37.4	110	210	231	0.380	0.002	0.031	27.0
5	620	406	42.5		2.30	253	.490	.005	.039	34.8
6	700	459	49.0		2.55	277	.639	.006	.050	45.4
7	775	507	53.1		2.95	325	.790	.007	.062	56.1
8	880	576	60.3		3.60	396	.990	.009	.079	70.3
9	970	635	66.5		4.20	462	1.190	.010	.095	84.5
10	1040	681	71.3		5.10	561	1.405	.011	.113	99.8
11	1115	731	76.5		6.00	660	1.620	.012	.131	115.0
12	1180	773	80.9	110	6.95	767	1.820	0.013	0.149	129.2

REMARKS— VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT AREA OF DUCT 0.7854 SQ. FT	MOTOR # 15-4112 H.P. 3/4

P_a	V_a	V_D	H_a	V_F	C_F	#/SEC.	H.P.IN.	H.P.OUT	M.E.%	EFF.%
0.142		2.20	29.32	11.89	9.34	0.682	0.145	0.0364	67.5	25.1
.355		2.77	37.92	13.34	10.47	.765	.184	.0527	67.5	28.7
.426		3.55	49.33	15.12	11.86	.866	.220	.0777	66.3	35.3
.497		4.40	60.99	16.82	13.21	.963	.268	.1064	68.7	39.7
.639		5.61	76.55	19.00	14.92	1.089	.345	.1515	67.8	43.9
.710		6.74	91.95	20.83	16.35	1.194	.413	.1995	67.0	48.3
.781		8.03	109.61	22.72	17.84	1.303	.495	.2595	69.4	52.4
.852		9.31	125.16	24.48	19.22	1.403	.549	.3205	68.8	58.3
0.923		10.58	140.70	26.08	21.46	1.491	0.620	0.3821	69.3	62.0



TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	8	DATE	2-14-11
DIAMETER - FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %.	45
WIDTH - RUNNER INCHES	9	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.18
NUMBER OF VANES	6	WET BULB 59° DRY BULB	72°	PULLEY RATIO.	1.458

N	M	B	P_h	E	I	W	S	P	V	S_A
5	395	576	60.3	110	5.7	627	1.023	0.008	0.080	72.7
6	420	613	64.8		6.2	682	1.225	.010	.098	87.0
7	470	686	71.8		6.7	737	1.475	.011	.120	104.7
8	510	744	78.9		7.5	825	1.742	.012	.140	123.6
9	570	832	87.1		8.5	935	2.065	.013	.165	146.6
10	615	897	93.9		9.8	1078	2.525	.015	.200	179.2
11	670	979	102.3		11.5	1265	3.020	.019	.245	214.4
12	725	1057	110.6		13.5	1485	3.600	.022	.288	255.5
13	780	1138	119.2		16.0	1760	4.150	.025	.335	294.6
14	865	1262	132.0		20.0	2200	5.000	.030	.403	355.0
15	940	1372	143.6		25.2	2760	5.900	.034	.455	419.0
16	1010	1474	154.4		31.0	3380	6.720	.039	.526	477.0
17	1065	1554	162.5		35.5	3870	7.400	.042	.580	525.0
18	1120	1634	171.0	110	45.5	4960	8.200	0.046	0.650	569.5

REMARKS –

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT.

AREA OF DUCT 0.7854 sq FT

MOTOR # 5-S-3976

H.P. 5.

Pa	Va	Vo	Ha	Ve	Cf	#/sec.	H.P. in	H.P. out	M.E. %	EFF. %
0.568		5.68	78.90	19.12	15.01	1.096	0.325	0.1571	65.9	48.3
.710		6.96	94.67	21.18	16.62	1.214	.430	.2089	70.2	54.4
.781		8.52	114.00	23.40	18.36	1.342	.510	.2781	67.4	54.5
.852		9.94	134.39	25.29	19.85	1.450	.640	.3542	67.1	55.4
.923		11.72	159.24	27.44	21.53	1.572	.795	.4552	64.0	57.3
1.065		14.20	194.47	30.21	23.71	1.731	.990	.6140	67.2	62.0
1.359		17.39	233.15	33.44	26.25	1.917	1.220	.8125	67.9	67.2
1.562		20.44	277.50	36.36	28.50	2.080	1.510	1.0490	69.0	69.5
1.775		23.79	320.17	39.10	30.68	2.238	1.795	1.3020	68.7	72.5
2.130		28.60	385.93	42.90	33.65	2.458	2.295	1.7250	67.3	75.2
2.414		32.30	453.71	45.60	35.78	2.610	2.860	2.1500	67.0	75.2
2.769		37.35	517.12	49.00	38.54	2.808	3.480	2.6400	66.3	75.8
2.980		41.19	569.17	51.42	40.35	2.945	3.940	3.0480	65.7	77.3
3.265		46.15	618.92	54.48	42.75	3.122	4.950	3.5090	64.5	70.9

REMARKS-

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT

AREA OF DUCT 0.7854 SQ. FT.

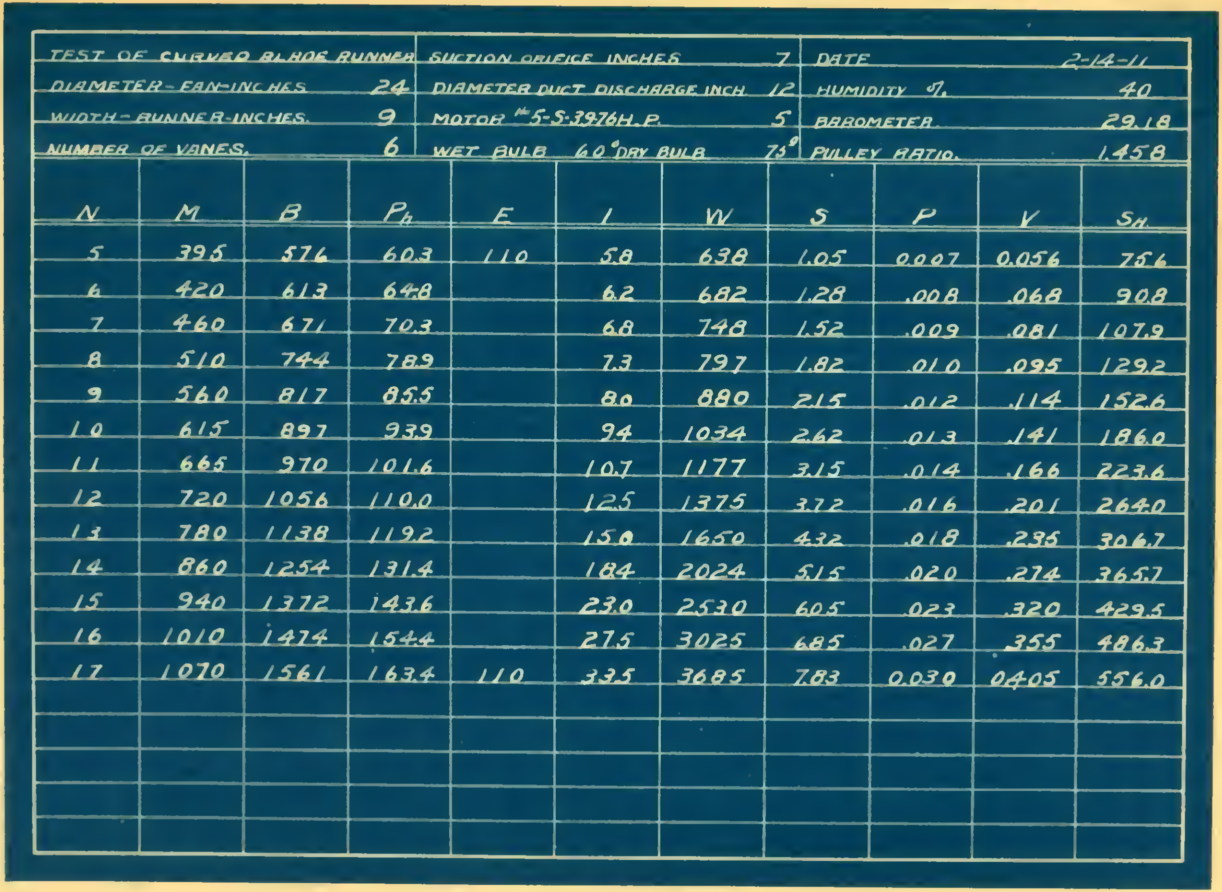
MOTOR # 15-4112

H.P. 3/4

P_A	V_A	V_O	H_A	V_F	C_F	#/SEC.	H.P. IN	H.P. OUT	M.E. %	EFF. %
0.142		1.420	28.18	9.56	7.51	0.548	0.145	0.0287	68.7	19.78
.213		1.988	38.40	11.30	8.87	.648	.184	.0452	64.2	24.58
.284		2.485	49.62	12.65	9.93	.725	.232	.0654	68.4	28.20
.426		3.124	63.15	14.18	11.14	.813	.273	.0933	69.2	33.65
.497		3.905	77.85	15.85	12.44	.908	.337	.1285	67.4	38.10
.568		4.543	95.61	17.10	13.42	.980	.418	.1704	70.2	40.75
.710		5.680	114.29	19.11	15.00	1.095	.485	.2274	70.7	46.85
.781		6.530	140.81	20.49	16.08	1.174	.520	.3005	70.8	57.70
0.852		7.245	156.50	21.59	16.94	1.237	0.608	0.3522	75.4	58.00

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	7	DATE	2-14-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	40.
WIDTH - RUNNER INCHES.	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.18
NUMBER OF VANES.	6	WET BULB 60 DRY BULB.	75	PULLEY RATIO.	0.655

N	M	B	Ph	E	I	W	S	P	V	Sa
4	530	347	36.4	110	2.10	231	0.38	0.002	0.020	26.62
5	625	410	43.9		2.30	253	.51	.003	.028	36.20
6	705	462	48.3		2.65	292	.66	.004	.035	46.85
7	790	518	54.2		3.00	330	.84	.006	.044	59.60
8	890	583	61.0		3.55	391	1.04	.007	.055	73.45
9	965	632	66.2		4.25	468	1.26	.008	.064	89.50
10	1065	688	72.1		5.00	550	1.52	.010	.080	107.90
11	1125	737	77.1		5.65	621	1.74	.011	.092	133.50
12	1190	780	81.7	110	6.80	748	1.95	0.012	0.102	138.40



TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES	7	DATE	2-14-11
DIAMETER-FAN-INCHES	24	DIAMETER DUCT DISCHARGE INCH	12	HUMIDITY %	40
WIDTH-RUNNER-INCHES.	9	MOTOR #5-S-3976 H.P.	5	BAROMETER.	29.18
NUMBER OF VANES.	6	WET BULB 60° DRY BULB	73°	PULLEY RATIO.	1.458

N	M	B	P_h	E	I	W	S	P	V	S_H
5	395	576	60.3	110	5.8	638	1.05	0.007	0.056	75.6
6	420	613	64.8		6.2	682	1.28	.008	.068	90.8
7	460	671	70.3		6.8	748	1.52	.009	.081	107.9
8	510	744	78.9		7.3	797	1.82	.010	.095	129.2
9	560	817	85.5		8.0	880	2.15	.012	.114	152.6
10	615	897	93.9		9.4	1034	2.62	.013	.141	186.0
11	665	970	101.6		10.7	1177	3.15	.014	.166	223.6
12	720	1056	110.0		12.5	1375	3.72	.016	.201	264.0
13	780	1138	119.2		15.0	1650	4.32	.018	.235	306.7
14	860	1254	131.4		18.4	2024	5.15	.020	.274	365.7
15	940	1372	143.6		23.0	2530	6.05	.023	.320	429.5
16	1010	1474	154.4		27.5	3025	6.85	.027	.355	486.3
17	1070	1561	163.4	110	33.5	3685	7.83	0.030	0.405	556.0

REMARKS —

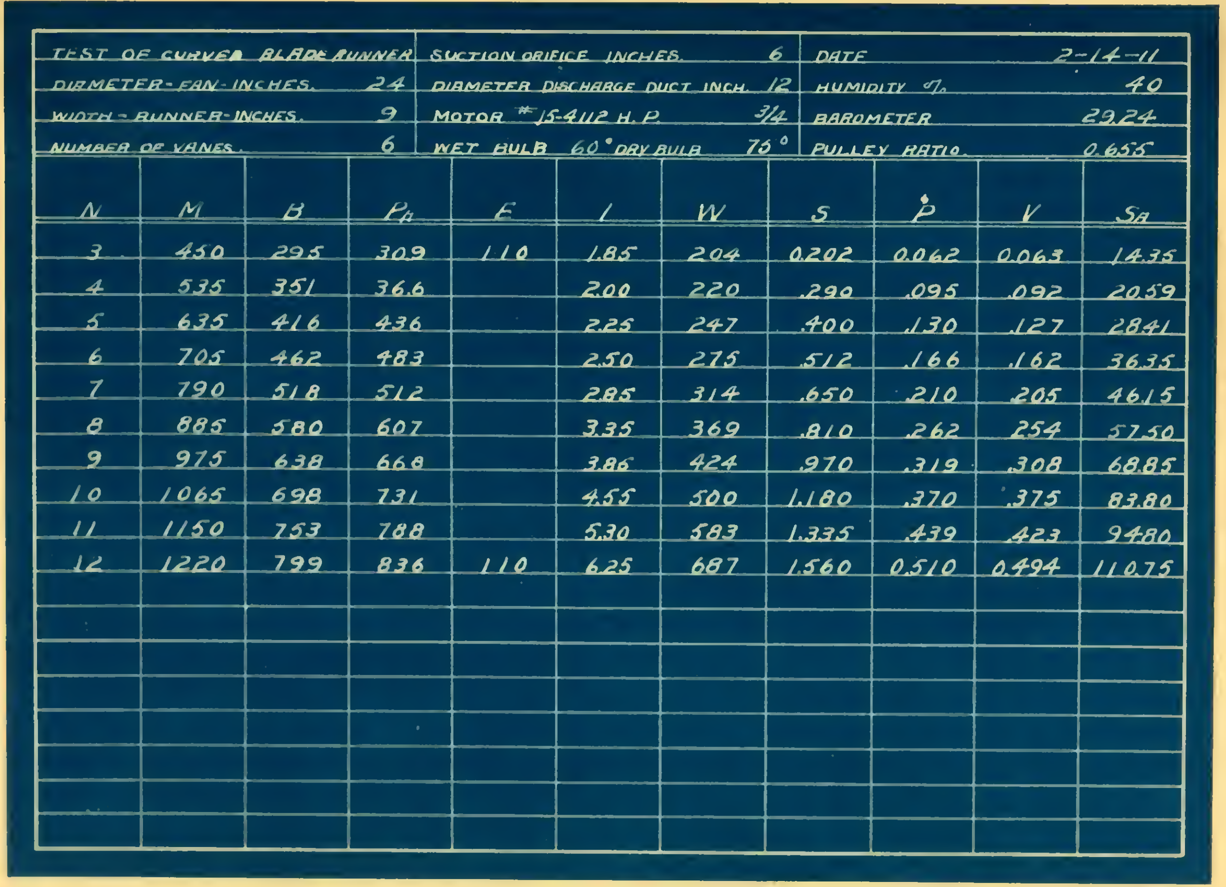
VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT

AREA OF DUCT 0.7854

MOTOR # 5-5-3976

H.P. 5

P_B	V_H	V_O	H_A	V_E	C_E	#/SEC.	H.P. IN	H.P. OUT	M.E. %	EFF %
0.497		3.98	79.02	15.98	12.55	.916	0.345	0.1316	70.9	36.2
.568		4.83	96.20	17.64	13.83	1.010	.435	.1766	73.8	40.6
.639		5.75	114.29	19.24	15.10	1.102	.525	.2290	74.5	43.6
.710		6.74	136.65	20.83	16.35	1.194	.610	.2975	70.7	48.7
.852		8.09	161.54	22.82	17.92	1.309	.725	.3846	71.1	53.0
.923		10.02	196.94	25.83	19.92	1.454	.945	.5205	71.9	55.1
.994		11.18	236.37	27.52	21.61	1.578	1.115	.6780	72.9	60.8
1.136		14.27	279.40	30.30	23.78	1.735	1.375	.8820	74.4	64.2
1.278		16.69	324.67	32.74	25.70	1.876	1.665	1.1060	73.6	66.5
1.420		19.45	386.57	35.35	27.75	2.026	2.204	1.4240	72.2	64.6
1.633		22.71	453.87	38.20	30.00	2.189	2.695	1.8060	70.9	67.0
1.916		25.20	513.42	40.25	31.60	2.308	3.125	2.1510	69.4	68.9
2.130		28.75	586.88	43.00	33.75	2.465	3.750	2.6340	70.8	70.3



TEST OF CURVED BLADE RUNNER	SUCTION ORIFICE INCHES. 6	DATE 2-14-11
DIAMETER-FAN-INCHES. 24	DIAMETER DISCHARGE DUCT INCH. 12	HUMIDITY %. 40
WIDTH-RUNNER-INCHES. 9	MOTOR # 15-4112 H.P. 3/4	BAROMETER 29.24
NUMBER OF VANES. 6	WET BULB 60° DRY BULB 75°	PULLEY RATIO. 0.655

N	M	B	P_A	E	I	W	S	$\dot{P}$	V	S_A
3	450	295	309	1.10	1.85	204	0.202	0.062	0.063	14.35
4	535	351	36.6		2.00	220	.290	.095	.092	20.59
5	635	416	436		2.25	247	.400	.130	.127	28.41
6	705	462	483		2.50	275	.512	.166	.162	36.35
7	790	518	512		2.85	314	.650	.210	.205	46.15
8	885	580	607		3.35	369	.810	.262	254	57.50
9	975	638	668		3.86	424	.970	.319	.308	68.85
10	1065	698	731		4.55	500	1.180	.370	.375	83.80
11	1150	753	788		5.30	583	1.335	.439	.423	94.80
12	1220	799	836	1.10	6.25	687	1.560	0.510	0.494	110.75

REMARKS-

VENTURI NOZZLE ON DISCHARGE DUCT DIAMETER
OF THROAT 6" AREA THROAT 0.21 Sq. FT

MOTOR # 15-4112
H.P. 3/4

Pa	Va	Vd	Ha	Vf	Cf	#/sec.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
4.41	4.47	0.320	19.08	4.535	3.560	0.2598	0.091	0.0090	64.4	9.92
6.75	6.54	.467	27.80	5.480	4.300	.3138	.129	.0159	67.1	12.30
9.23	9.02	.645	38.29	6.440	5.058	.3692	.177	.0257	65.0	14.52
11.79	11.51	.823	48.96	7.275	5.115	.4170	.213	.0371	67.6	17.40
14.91	14.56	1.041	62.10	8.185	6.425	.4690	.255	.0530	76.1	20.80
18.60	18.04	1.290	77.39	9.110	7.150	.5220	.313	.0734	67.6	23.42
22.65	21.87	1.564	93.06	10.020	7.870	.5745	.373	.0973	67.2	26.10
26.29	26.63	1.904	111.99	11.060	8.680	.6340	.439	.1280	67.5	29.15
31.04	30.04	2.148	127.99	11.760	9.230	.6745	.488	.1569	66.4	32.15
36.22	35.10	2.510	149.48	12.710	9.980	0.7285	0.560	0.1980	68.9	35.35

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	6	DATE.	2-14-11
DIAMETER - FAN - INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %.	40
WIDTH - RUNNER - INCHES.	9	MOTOR #5-S-3976 H.P.	5	BAROMETER.	29.24
NUMBER OF VANES	6	WET BULB 60° DRY BULB	75°	PULLEY RATIO.	1.458

N	M	B	P_h	E	I	W	S	P	V	S_B
5	395	576	60.3	110	5.8	638	.83	0.280	0.266	58.9
6	430	627	65.7		6.0	660	.99	.333	.317	70.0
7	480	700	73.3		6.4	704	1.18	.393	.374	83.7
8	530	773	80.9		6.8	748	1.39	.468	.444	98.7
9	560	817	85.5		7.5	825	1.65	.552	.530	117.2
10	615	897	93.9		8.6	946	2.00	.669	.635	142.0
11	670	978	102.3		9.8	1077	2.40	.798	.759	170.4
12	725	1057	110.6		11.3	1243	2.83	.950	.905	201.0
13	790	1162	121.6		13.0	1430	3.32	1.105	1.045	235.6
14	865	1262	132.0		16.2	1782	3.95	1.320	1.245	280.4
15	945	1390	145.5		20.2	2220	4.69	1.579	1.480	333.0
16	1020	1487	155.6		24.5	2695	5.45	1.850	1.715	387.0
17	1085	1583	165.5		29.4	3234	6.15	2.075	1.942	486.5
18	1165	1698	177.8		35.5	3905	7.10	2.395	2.230	504.0
19	1200	1750	183.2	110	40.2	4420	7.65	2.590	2.430	543.0

REMARKS—

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF THROAT 6" AREA THROAT 0.21 SQ. FT.

MOTOR # 5-S-3976
H.P. 5

Pa	Va	Vo	Ha	VE	CE	#/SEC.	H.P. IN.	H.P. OUT.	M.E. %	EFF. %
19.9	18.89	1.35	80.72	9.33	7.33	0.535	0.345	0.078	71.4	22.6
23.6	22.50	1.61	95.25	10.17	7.99	.583	.405	.101	71.1	26.7
27.9	26.55	1.90	113.50	11.07	8.69	.635	.460	.131	68.0	28.5
33.2	31.52	2.25	134.99	12.03	9.45	.690	.545	.169	66.5	31.0
39.2	37.63	2.69	159.09	13.10	10.29	.751	.650	.217	70.1	32.7
47.5	45.08	3.23	192.73	14.41	11.31	.825	.825	.289	70.4	35.0
56.7	53.85	3.59	230.64	15.19	11.93	.871	.985	.365	70.9	37.0
67.5	64.25	4.60	273.05	17.18	13.49	.985	1.205	.489	71.9	40.6
78.5	74.20	5.31	319.36	18.48	14.52	1.059	1.395	.615	69.6	44.1
93.8	88.40	6.33	380.50	20.18	16.18	1.181	1.805	.879	70.3	48.7
112.1	105.20	7.51	452.61	21.98	17.25	1.260	2.275	1.035	68.8	45.5
131.4	126.70	9.06	527.06	24.15	18.96	1.384	2.775	1.327	70.0	47.8
147.4	137.90	9.86	643.76	25.20	19.77	1.444	3.305	1.688	75.7	51.0
170.0	158.30	11.32	685.32	26.98	21.19	1.546	3.955	1.926	69.7	48.7
183.9	172.50	12.34	739.24	28.18	22.12	1.615	4.375	2.170	70.0	47.3

TEST OF CURVE BLADE RUNNER		SUCTION ORIFICE INCHES.	5	DATE	2-16-11
DIAMETER – FAN–INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY	55
WIDTH – RUNNER – INCHES.	9	MOTOR # 15-4112 H. P.	3/4	BAROMETER	29.69
NUMBER OF VANES.	6	WET BULB 66° DRY BULB	71°	PULLEY RATIO.	0.655

N	M	B	P_h	E	I	W	S	P	V	S_a
3	450	295	30.9	110	1.91	209	0.230	0.039	0.039	16.3
4	530	347	36.2		2.05	226	.329	.053	.054	23.4
5	615	403	42.2		2.15	237	.439	.071	.071	31.2
6	705	462	48.3		2.45	270	.580	.095	.095	41.2
7	775	507	53.1		2.85	314	.725	.122	.122	51.5
8	890	583	61.0		3.30	363	.929	.155	.153	66.0
9	985	645	67.5		3.85	424	1.140	.189	.188	81.0
10	1085	711	74.5		5.15	567	1.385	.231	.230	98.3
11	1175	770	80.6		5.50	605	1.630	.275	.272	115.7
12	1240	813	85.1		6.45	709	1.850	.310	.308	131.3
13	1300	852	89.2	110	7.40	814	2.035	0.343	0.339	144.5

REMARKS—

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF THROAT 6" AREA 0.21 SQ. FT.

MOTOR # 15-4112

H.P. 3/4

Pa	Va	Vo	Ha	VF	CF	#/SEC.	H.P.IN.	H.P.OUT	M.E. %	EFF %
2.77	2.77	0.198	19.30	3.57	2.80	0.2045	0.098	0.0072	65.1	7.33
3.76	3.76	.269	27.38	4.16	3.27	.2384	.137	.0121	66.9	8.81
5.04	5.04	.361	36.56	4.75	3.73	.2720	.163	.0181	66.2	11.10
6.74	6.74	.482	48.42	5.56	4.37	.3185	.207	.0281	66.9	13.56
8.66	8.66	.619	60.78	6.31	4.95	.3615	.255	.044	69.4	15.67
11.01	10.86	.777	77.74	7.07	5.54	.4050	.307	.0570	67.3	18.55
13.42	13.35	.955	95.33	7.84	6.15	.4490	.373	.0778	67.4	20.85
16.40	16.33	1.168	115.87	8.66	6.80	.4960	.500	.1045	67.2	20.65
19.52	19.32	1.382	136.60	9.43	7.40	.5410	.506	.1341	67.7	26.40
22.00	21.86	1.564	154.86	10.03	7.88	.5750	.577	.1620	68.9	28.05
24.40	24.06	1.720	170.92	10.52	8.26	0.6030		0.1960	69.2	

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	5	DATE	2-16-11
DIAMETER, FAN INCHES	24	DIAMETER-DISCHARGE-DUCT, INCH	12	HUMIDITY %	55
WIDTH, RUNNER INCHES	9	MOTOR # 5-S-3976H.P	5	BAROMETER	29.69
NUMBER OF VANES	6	WET BULB 66° DRY BULB	77°	PULLEY RATIO	1.458

N	M	B	Pu	E	I	W	S	P	V	Sa
5	390	585	59.5	110	5.5	605	.925	0.155	0.154	65.7
6	420	630	64.2		5.7	627	1.114	.185	.184	79.1
7	470	705	71.8		6.2	682	1.330	.223	.221	94.4
8	510	765	78.9		6.7	737	1.590	.265	.264	112.9
9	555	832	84.8		7.3	803	1.890	.320	.314	134.2
10	615	922	93.9		8.2	902	2.285	.385	.380	162.2
11	675	1012	103.0		9.5	1045	2.730	.460	.454	193.8
12	725	1087	110.6		11.0	1210	3.240	.550	.541	230.0
13	785	1177	119.7		12.5	1375	3.800	.645	.635	269.7
14	870	1305	132.8		15.5	1705	4.600	.775	.763	326.5
15	955	1432	146.0		19.8	2180	5.550	.935	.920	394.0
16	1040	1560	158.7		25.0	2750	6.520	1.095	1.071	462.9
17	1110	1665	169.6	110	30.7	3377	7.500	1.255	1.240	532.2

REMARKS —

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF

THROAT. AREA. 0.21 SQ. FT.

MOTOR # 5-S-3976

H.P. 5

P_A	V_A	V_O	H_A	V_E	C_E	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
11.01	10.93	0.782	77.49	7.09	5.57	0.407	0.295	0.0573	70.4	19.4
13.14	13.06	.934	93.16	7.75	6.08	.444	.360	.0752	72.8	20.9
15.84	15.69	1.122	111.36	8.50	6.68	.487	.430	.0986	69.6	22.9
18.82	18.74	1.340	133.06	9.29	7.29	.532	.530	.1288	68.8	24.3
22.12	22.29	1.594	158.51	10.13	7.95	.581	.625	.1675	70.9	26.8
27.34	27.00	1.931	191.47	11.15	8.75	.639	.775	.2222	69.9	28.7
32.67	32.24	2.305	228.78	12.18	9.56	.698	.950	.2905	68.9	30.6
39.05	35.80	2.560	271.61	12.84	10.09	.732	1.165	.3636	71.5	31.2
45.80	45.09	3.225	318.73	14.41	11.31	.826	1.325	.4790	71.7	36.1
55.00	54.18	3.875	385.38	15.78	12.39	.905	1.885	.6340	70.3	33.1
66.38	65.30	4.670	465.05	17.33	13.60	.993	2.365	.8410	70.2	35.6
77.75	76.05	5.360	545.01	18.56	14.58	1.065	2.830	1.0540	69.7	37.3
89.10	88.00	6.290	627.59	20.12	15.80	1.153	3.365	1.3150	70.2	39.1

TEST OF CURVED BLADE RUNNER.		SUCTION-ORIFICE INCHES	4	DATE	2-16-11
DIAMETER - FAN, INCHES	24	DIAMETER DISCHARGE DUCT, INCH.	12	HUMIDITY %	56
WIDTH - RUNNER, INCHES	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.69
NUMBER OF VANES	6	WET BULB 67° DRY BULB	78°	PULLEY RATIO	0.655

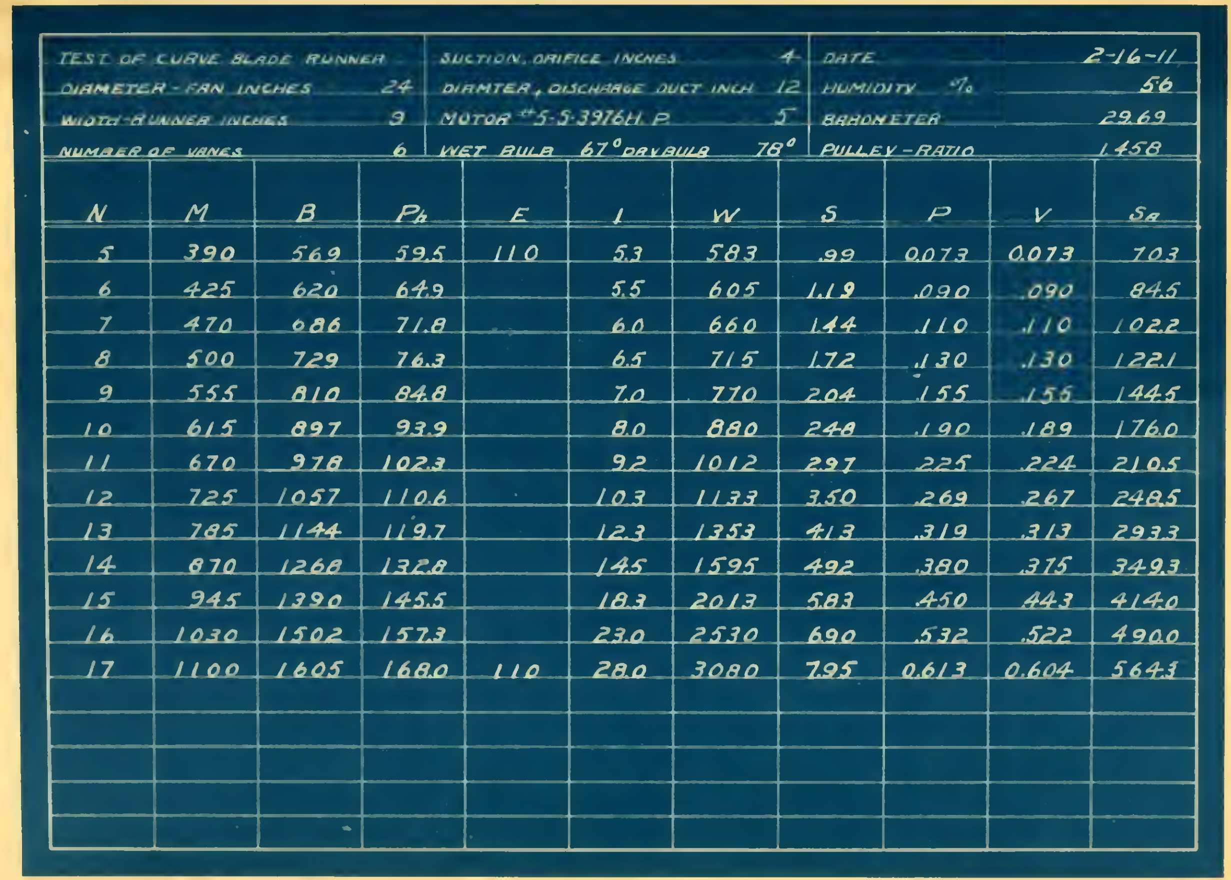
N	M	B	Ph	E	I	W	S	P	V	Sa
3	455	298	31.2	110	1.95	215	0.265	0.019	0.019	18.2
4	535	351	36.6		2.05	226	.365	.025	.025	25.9
5	625	410	43.9		2.25	248	.490	.035	.035	34.8
6	705	462	48.3		2.55	281	.640	.046	.046	45.5
7	790	518	51.2		2.85	314	.810	.059	.059	57.5
8	900	590	61.6		3.35	369	1.025	.075	.075	72.8
9	985	645	67.5		3.80	418	1.228	.090	.090	87.3
10	1090	714	74.7		5.15	567	1.505	.112	.112	106.8
11	1165	763	79.9		5.35	589	1.725	.130	.130	122.5
12	1240	813	85.1		6.45	710	2.050	.152	.152	145.6
13	1310	858	89.8	110	7.35	809	2.205	0.167	0.167	156.5

REMARKS—

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF THROAT 6". AREA 0.21 SQ.FT.

MOTOR # 15-4112
H.P. 3/4.

Pa	Va	Vo	Ha	Vf	Cf	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
1.35	1.35	0.097	20.27	2.49	1.96	0.1428	0.106	0.0053	67.1	4.97
1.78	1.78	.127	27.83	2.86	2.25	.1639	.137	.0083	66.9	6.05
2.49	2.49	.178	37.49	3.38	2.65	.1937	.177	.0132	62.7	7.47
3.27	3.27	.233	48.95	3.87	3.04	.2220	.220	.0198	67.6	8.98
4.19	4.19	.300	61.99	4.39	3.45	.2517	.255	.0284	76.1	11.13
5.33	5.33	.381	77.51	4.95	3.89	.2837	.313	.0400	65.8	12.78
6.49	6.49	.464	94.25	5.46	4.29	.3130	.368	.0537	66.6	14.60
7.95	7.95	.569	115.32	6.05	4.75	.3470	.491	.0727	66.6	14.80
9.23	9.23	.660	132.39	6.52	5.12	.3734	.493	.0899	66.7	18.27
10.79	10.79	.772	157.16	7.04	5.53	.4075	.577	.1153	69.9	20.00
11.86	11.86	0.840	169.20	7.35	5.77	0.4210		.1295	67.5	



TEST OF CURVE BLADE RUNNER		SUCTION, ORIFICE INCHES	4	DATE	2-16-11
DIAMETER - FAN INCHES	24	DIAMTER, DISCHARGE DUCT INCH	12	HUMIDITY %	56
WIDTH - RUNNER INCHES	9	MOTOR #5-5-3976 H.P.	5	BAROMETER	29.69
NUMBER OF VANES	6	WET BULB 67° DRY BULB	78°	PULLEY - RATIO	1.458

N	M	B	P_h	E	I	W	S	P	V	S_a
5	390	569	59.5	110	5.3	583	.99	0.073	0.073	70.3
6	425	620	64.9		5.5	605	1.19	.090	.090	84.5
7	470	686	71.8		6.0	660	1.44	.110	.110	102.2
8	500	729	76.3		6.5	715	1.72	.130	.130	122.1
9	555	810	84.8		7.0	770	2.04	.155	.155	144.5
10	615	897	93.9		8.0	880	2.48	.190	.189	176.0
11	670	978	102.3		9.2	1012	2.97	.225	.224	210.5
12	725	1057	110.6		10.3	1133	3.50	.269	.267	248.5
13	785	1144	119.7		12.3	1353	4.13	.319	.313	293.3
14	870	1268	132.8		14.5	1595	4.92	.380	.375	349.3
15	945	1390	145.5		18.3	2013	5.83	.450	.443	414.0
16	1030	1502	157.3		23.0	2530	6.90	.532	.522	490.0
17	1100	1605	168.0	110	28.0	3080	7.95	0.613	0.604	564.3

REMARKS–

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF DUCT 6"

AREA: THROAT 0.21 SQ FT

MOTOR # 5-5-3976

H.P. 5

PA	VA	VO	HA	VE	CE	#/SEC	H.P. IN.	H.P. OUT	M.E. %	EFF. %
5.19	5.19	0.371	75.86	4.88	3.83	0.280	0.273	0.0385	69.0	14.1
6.39	6.39	.457	91.35	5.42	4.26	.311	.330	.0513	69.9	15.5
7.81	7.81	.557	110.57	5.99	4.70	.343	.405	.0691	69.1	17.1
9.23	9.23	.660	131.99	6.51	5.11	.373	.500	.0896	73.0	17.9
11.01	11.01	.787	156.30	7.11	5.58	.408	.580	.1158	70.1	20.0
13.49	13.42	.960	190.45	7.85	6.17	.450	.740	.1560	69.5	21.1
15.97	15.90	1.136	227.61	8.55	6.71	.490	.910	.2030	69.9	22.3
19.10	18.96	1.355	268.96	9.34	7.33	.535	1.065	.2610	71.0	24.5
22.65	22.23	1.590	317.21	10.12	7.94	.579	1.300	.3346	71.5	25.7
27.00	26.63	1.910	378.21	11.09	8.70	.636	1.595	.4370	69.0	27.4
31.95	31.45	2.250	448.20	12.03	9.46	.689	2.265	.5620	68.2	25.5
37.80	37.08	2.650	530.45	13.06	10.25	.748	2.600	.7210	68.9	27.7
43.54	42.90	3.070	610.91	14.06	11.04	0.805	3.145	0.8950	69.7	28.4

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES	3	DATE	2-17-11
DIAMETER OF FAN INCHES	24	DIAMETER DISCHARGE DUCT	12	HUMIDITY %	45
WIDTH-RUNNER INCHES	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.57
NUMBER OF VANES	6	WET BULB 57° DRY BULB	67°	PULLEY RATIO.	0.655

N	M	B	Ph	E	I	W	S	P	V	SA
3	465	305	31.9	110	1.85	204	0.295	0.009	0.009	20.95
4	545	357	37.4		1.95	215	.405	.012	.012	28.75
5	640	419	43.9		2.20	242	.555	.015	.015	39.40
6	720	472	54.0		2.35	259	.695	.020	.020	49.35
7	805	527	55.2		2.75	303	.865	.025	.025	61.40
8	900	590	61.6		3.15	347	1.075	.033	.032	76.30
9	1000	655	68.8		3.70	407	1.310	.044	.039	93.00
10	1090	714	74.7		4.50	473	1.575	.050	.047	111.80
11	1185	778	81.3		5.25	577	1.860	.058	.055	133.50
12	1290	845	88.4		6.40	704	2.140	.066	.064	151.90
13	1330	871	91.2	110	7.30	803	2.340	0.073	.070	166.20

REMARKS —

VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF THROAT 6". AREA OF THROAT 0.21 SQ. FT.

MOTOR # 15-4112
H.P. 3/4

Pa	Va	Vo	Ha	Vf	Cf	#/sec.	H.P. in.	H.P. out.	M.E. %	EFF. %
.639	.639	0.0455	21.64	1.710	1.343	0.0980	0.091	0.0039	68.5	4.25
852	.852	.0690	27.67	21.06	1.654	.1207	.123	.0065	68.3	5.25
1.065	1.065	.0761	40.55	22.13	1.737	.1269	.170	.0094	67.9	5.50
1.420	1.420	.1016	50.87	25.58	2.010	.1467	.194	.0136	66.9	5.86
1.775	1.775	.1270	63.31	28.60	2.246	.1640	.245	.0189	66.9	7.70
2.344	2.272	.1625	78.80	32.34	2.580	.1854	.290	.0266	66.5	9.17
3.125	2.770	.1980	96.33	35.70	2.800	.2045	.356	.0393	65.5	11.03
3.550	3.336	.2385	115.59	39.16	3.075	.2245	.414	.0472	66.8	11.30
4.120	3.905	.2790	137.90	42.35	3.325	.2426	.485	.0680	67.2	14.03
4.690	4.545	.3250	156.92	45.70	3.590	.2620	.573	.0748	64.5	13.05
4.990	4.970	0.3555	171.55	47.80	3.755	0.2741	0.	0.0856	66.4	

TEST OF CURVED BLADE RUNNER		SUCTION - ORIFICE INCHES	3	DATE	2-17-11
DIAMETER - FAN INCHES	24	DIAMETER DISCHARGE DUCT, INCH	12	HUMIDITY	45
WIDTH - RUNNER INCHES	9	MOTOR № 5-S-3976 H. P.	5	BAROMETER	29.51
NUMBER OF VANES	6	WET BULB 57° DRY BULB	67°	PULLEY RATIO	1.458

N	M	B	P_a	E	I	W	S	P	V	S_a
5	390	569	59.5	110	5.0	550	1.029	0.034	0.033	73.0
6	420	613	64.2		5.3	583	1.245	.040	.039	84.4
7	465	678	71.0		5.6	616	1.495	.048	.046	106.2
8	510	744	78.9		6.2	682	1.780	.057	.055	126.4
9	555	810	84.8		6.7	737	2.116	.068	.065	150.2
10	615	897	93.9		7.7	847	2.565	.083	.080	182.1
11	670	978	102.3		8.9	979	3.100	.101	.096	220.0
12	730	1075	112.5		10.2	1122	3.650	.119	.114	259.2
13	790	1162	121.6		12.0	1320	4.280	.140	.135	303.9
14	870	1268	132.8		14.5	1595	5.120	.177	.163	363.5
15	940	1372	143.6		17.5	1925	5.980	.193	.189	424.5
16	1015	1480	155.0		21.5	2365	7.000	.224	.219	497.0
17	1095	1597	167.2	110	26.8	2948	8.130	0.254	0.250	577.5

REMARKS —
VENTURI NOZZLE ON DISCHARGE DUCT. DIAMETER OF
THROAT 6", AREA THROAT 0.21 SQ. FT. AREA DUCT 0.7854

MOTOR # 5-5-3976
H.P. 5

Pa	Va	Vd	Ha	Vs	Cf	#/sec.	H.P. in.	H.P. out.	M.E. %	EFF. %
2.41	2.34	0.168	75.63	3.28	2.58	0.1884	0.225	0.0259	68.8	11.50
2.84	2.77	.198	87.44	3.57	280	.2045	.305	.0325	68.3	10.50
3.41	3.27	.234	109.84	3.88	3.04	.2220	.345	.0444	70.2	12.85
4.05	3.91	.279	130.73	4.24	3.33	.2430	.455	.0577	67.2	12.70
4.84	4.62	.330	155.37	4.61	3.62	.2640	.540	.0747	69.6	13.85
5.89	5.68	.406	188.40	5.11	4.01	.2930	.700	.1003	68.8	14.35
7.17	6.82	.487	227.66	5.59	4.39	.3205	.865	.1327	70.0	15.32
8.45	8.09	.579	268.33	6.10	4.79	.3495	1.055	.1704	683	16.15
9.94	9.59	.686	314.53	6.64	5.22	.3910	1.260	.2180	68.5	17.30
12.57	11.57	.827	376.90	7.29	5.72	.4180	1.590	.2860	68.8	18.00
13.70	13.42	.960	439.16	7.86	6.17	.4505	1.945	.3600	68.5	18.50
15.90	15.55	1.112	514.01	8.46	6.64	.4850	2460	.4535	68.9	18.40
18.04	17.75	1.270	596.81	9.04	7.10	0.5180	3.035	0.5630	68.8	18.55

TEST OF CURVED BLADE RUNNER.		SUCTION ORIFICE INCHES	0	DATE	2-17-11
DIAMETER — FAN INCHES.	24	DIAMETER-DISCHARGE DUCT INCH.	12	HUMIDITY %	58
WIDTH - RUNNER INCHES	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER	29.57
NUMBER OF VANES	6	WET BULB 65° DRY BULB	75°	PULLEY RATIO	0.655

N	M	B	P_h	E	I	W	S	P	V	Sa
3	455	298	31.2	110	1.85	204	0.279	0.017		19.8
4	540	354	37.0		1.95	215	.385	.025		27.3
5	635	416	43.6		2.20	242	.515	.032		36.6
6	715	468	49.0		2.40	264	.665	.042		47.2
7	800	524	54.9		2.70	297	.815	.050		57.9
8	900	590	61.6		3.15	347	1.030	.060		73.1
9	985	645	67.5		3.65	402	1.240	.071		88.1
10	1085	711	74.5		4.30	473	1.515	.085		107.6
11	1180	773	80.9		5.25	578	1.800	.096		127.9
12	1290	845	88.4		6.15	676	2.080	.110		147.7
13	1330	871	91.2	110	7.00	770	2.260	0.120		160.5

REMARKS –

BLANK ORIFICE ON SUCTION AND 1.25 INCH ORIFICE ON DISCHARGE. STATIC HEAD IN DUCT BECOMES VELOCITY HEAD AT ORIFICE. NO VELOCITY HEAD IN DUCT.

MOTOR # 15-4112
H.P. 3/4

				ORIFICE.						
P_a	V_a	V_d	H_a	V_f	C_f	#/SEC.	H.P. IN	H.P. OUT	M.E. %	EFF. %
1.21	1.21		21.02	8.81	0.0450				69.5	
1.78	1.78		29.12	10.68	.0546				68.5	
2.27	2.27		38.83	12.09	.0618				65.9	
2.98	2.98		50.18	13.86	.0708				67.3	
3.55	3.55		61.42	15.12	.0772				65.7	
4.26	4.26		77.36	16.56	.0846				65.6	
5.04	5.04		93.09	18.01	.0920				65.7	
6.04	6.04		113.64	19.70	.1006				65.9	
6.82	6.82		134.72	20.94	.1070				66.3	
7.81	7.81		155.51	22.42	.1145				64.1	
8.52	8.52		169.02	23.40	0.1195				65.4	

TEST OF CURVED BLADE RUNNER.		SUCTION ORIFICE INCHES.	0	DATE	2-17-11
DIAMETER – FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	58
WIDTH – RUNNER. INCHES.	9	MOTOR # 5-5-3976 H. P.	5	BAROMETER	29.57
NUMBER OF VANES.	6	WET BULB 65° DRY BULB	75°	PULLEY RATIO.	1.458.

N	M	B	P_h	E	I	W	S	P	V	Sa.
5	395	576	60.3	110	5.0	550	1.02	0.061		72.4
6	425	620	64.9		5.5	605	1.25	.074		88.8
7	470	686	71.8		5.7	627	1.47	.083		104.4
8	510	744	78.9		6.2	682	1.76	.096		134.9
9	565	825	86.4		6.8	748	2.08	.109		147.7
10	615	897	93.9		7.8	858	2.51	.137		177.9
11	670	978	102.3		9.0	990	2.97	.185		211.0
12	730	1075	112.5		10.2	1122	3.52	.193		250.0
13	790	1162	121.6		11.7	1287	4.12	.210		292.5
14	865	1262	132.0		14.0	1540	4.90	.260		348.0
15	945	1390	145.5		17.5	1925	5.80	.301		412.0
16	1025	1495	156.5		21.5	2365	6.80	.380		483.0
17	1100	1605	168.0	110	26.5	2915	7.95	0.412		564.3

REMARKS —

BLANK ORIFICE ON SUCTION AND 1.25 INCH ORIFICE ON DISCHARGE DUCT. STATIC HEAD IN DUCT BECOMES VELOCITY HEAD AT ORIFICE. NO VELOCITY HEAD IN DUCT.

MOTOR # 5-S-3976
H.P. 5

Pa	Va	Vo	Ha	Vf	Cf	#/sec.	H.P. in.	H.P. out	M.E. %	EFF. %
3.833	3.833		76.23	15.7	0.0820				67.6	
5.253	5.253		78.05	18.4	.0940				59.7	
5.893	5.893		109.29	19.5	.0990				68.3	
6.818	6.818		141.72	21.0	.1070				73.3	
7.740	7.740		155.44	22.3	.1140				67.1	
9.730	9.730		187.63	25.0	.1277				68.5	
13.140	13.140		224.14	29.1	.1487				68.9	
13.700	13.700		263.70	29.7	.1516				67.1	
14.920	14.920		307.42	31.0	.1585				66.9	
18.460	18.460		366.46	34.5	.1762				67.8	
21.380	21.380		433.38	37.1	.1893				65.9	
26.990	26.990		509.99	41.7	.2130				67.0	
29.250	29.250		593.55	43.4	0.2220				67.1	

TEST OF STR. BLADE RUNNER.		SUCTION ORIFICE, INCHES	O.	DATE	2-21-11
DIAMETER - FAN WHEEL INCHES	24	DIAMETER DISCHARGE DUCT-INCH	12	HUMIDITY %	57
WIDTH - RUNNER INCHES.	9	MOTOR# 5-S-3976 H.P.	5	BAROMETER	29.78
NUMBER OF VANES	6	WET BULB 68° DRY BULB	79°	PULLEY RATIO	1.458

N	M	B	Ph	E	I	W	S	P	V	Sa
5	390	585	61.3	110	5.2	572	.87	0.045		61.8
6	420	630	66.0		5.4	594	1.03	.065		73.1
7	465	698	73.1		5.5	605	1.22	.075		86.6
8	510	766	80.2		5.9	649	1.45	.090		103.0
9	550	833	87.2		6.3	693	1.70	.110		120.7
10	620	930	97.4		7.0	770	2.06	.160		146.3
11	665	998	104.5		7.8	858	2.46	.160		174.7
12	720	1098	113.0		8.8	968	2.91	.180		206.7
13	775	1163	121.8		10.0	1100	3.40	.202		241.3
14	850	1275	133.5		11.0	1210	3.95	.302		280.5
15	930	1395	1460		12.8	1408	4.75	.401		337.5
16	1000	1500	1570		15.5	1705	5.50	.490		390.5
17	1080	1620	1696		18.5	2035	6.30	.510		447.5
18	1180	1770	1854	110	24.2	2662	7.70	0.730		547.0

REMARKS—

BLANK ORIFICE ON SUCTION, AND 1.25 INCH ORIFICE ON DISCHARGE DUCT. STATIC HEAD IN DUCT BECOMES VELOCITY HEAD AT ORIFICE NO VELOCITY HEAD IN DUCT.

MOTOR # 5-S-3976
H.P. 5

PA	VA	VD	HA	ORIFICE VF	CF	#/SEC	H.P. IN	H.P. OUT	M.E %	EFF %
3.20	3.20		68.17	14.35	0.123				58.4	
4.62	4.62		82.33	17.23	.147				60.9	
5.32	5.32		97.25	18.51	.158				58.6	
6.39	6.36		115.78	20.25	.173				57.9	
7.81	7.81		136.32	22.42	.191				57.8	
11.36	11.36		169.02	27.00	.230				57.4	
11.36	11.36		197.42	27.00	.230				58.2	
12.78	12.78		232.26	28.66	.245				56.0	
14.34	14.34		269.98	30.37	.259				58.7	
21.45	21.45		323.40	36.65	.313				58.4	
28.47	28.47		394.44	42.81	.355				59.6	
34.80	34.80		460.10	47.30	.404				60.1	
36.20	36.20		519.90	48.24	.412				58.2	
51.82	51.82		650.64	57.70	0.492				61.0	

TEST OF STRAIGHT BLADE RUNNER		SUCTION ORIFICE INCHES.	3	DATE	2-21-11
DIAMETER—FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	57
WIDTH—RUNNER INCHES	9	MOTOR #15-4112 H.P.	3/4	BAROMETER	29.78
NUMBER OF VANES.	6	WET BULB 68° DRYBULB. 79°		PULLEY RATIO.	0.655

N	M	B	P_H	E	I	W	S	P	V	S_A
3	455	298	31.2	110	1.80	198.0	.235	0.005	0.005	16.68
4	535	350	36.4		1.85	203.5	.320	.009	.009	22.72
5	625	409	42.6		1.95	214.5	.432	.013	.013	30.90
6	705	462	48.4		2.15	236.5	.565	.015	.015	40.11
7	790	518	53.9		2.40	264.0	.700	.019	.019	49.70
8	885	580	60.3		2.80	308.0	.894	.024	.023	63.23
9	975	638	66.4		3.20	352.0	1.055	.028	.028	74.90
10	1015	704	73.2		3.75	412.5	1.285	.035	.035	91.23
11	1175	770	80.1		4.35	478.5	1.545	.044	.041	109.70
12	1250	819	85.2		5.00	550.0	1.785	.050	.048	126.70
13	1320	865	90.0		5.75	632.5	1.970	.055	.054	139.80
14	1380	904	94.0	110	6.30	693.0	2.160	0.064	0.061	153.40

REMARKS—

VENTURI METER ON DISCHARGE DUCT

AREA OF THROAT 0.21 SQ. FT.

MOTOR #15-4112

H.P. 3/4

P_A	V_A	V_o	H_A	V_F	C_F	#/SEC.	H.P. IN	H.P. OUT	M.E. %	EFF. %
0.355	0.355	0.0254	17.06	1.28	1.004	0.0732	0.084	0.00227	56.5	2.70
.639	.639	.0457	23.41	1.71	1.345	.0982	.107	.00418	55.1	3.81
.923	.923	.0660	31.89	2.06	1.618	.1182	.133	.00685	56.6	5.15
1.065	1.065	.0761	41.25	2.21	1.738	.1268	.166	.00951	57.9	5.73
1.349	1.349	.0955	51.15	2.49	1.956	.1428	.201	.01325	56.7	6.61
1.704	1.633	.1168	65.05	2.74	2.152	.1572	.246	.01860	57.6	7.56
1.989	1.989	.1422	77.03	3.02	2.372	.1734	.296	.02430	56.3	8.21
2.485	2.485	.1777	93.90	3.48	2.651	.1936	.353	.03305	56.5	9.37
3.125	2.910	.2080	113.03	3.66	2.870	.2098	.395	.04310	56.7	10.91
3.550	3.410	.2440	130.49	3.96	3.110	.2272	.447	.05390	57.9	12.06
3.905	3.835	.2741	143.98	4.20	3.295	.2406	.515	.06300	57.3	12.24
4.545	4.332	0.3100	158.26	4.46	3.505	0.2559	0.547	.07350	57.7	13.44

TEST OF STR. BLADE RUNNER.		SUCTION ORIFICE INCHES.	3	DATE	2-21-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	57
WIDTH - RUNNER INCHES.	9	MOTOR #5-S-3976 H.P. 5.		BAROMETER	29.78
NUMBER OF VANES.	6	WET BULB 68° DRY BULB 79°		PULLEY RATIO.	1.458

N	M	B	P_a	E	I	W	S	P	V	Sa.
5	390	569	59.6	110	5.1	561	0.894	0.025	0.025	63.5
6	430	627	65.7		5.2	572	1.080	.030	.030	76.7
7	475	693	72.6		5.4	594	1.290	.039	.039	91.6
8	510	744	77.9		5.7	627	1.535	.045	.044	109.0
9	565	824	86.3		6.3	693	1.830	.053	.050	130.0
10	635	926	97.0		7.0	770	2.210	.065	.062	156.9
11	675	985	103.2		7.9	869	2.635	.077	.075	187.0
12	730	1065	111.5		9.2	1012	3.150	.092	.090	223.6
13	790	1152	120.6		10.3	1133	3.650	.112	.108	259.0
14	865	1262	132.2		12.0	1320	4.350	.136	.132	308.8
15	935	1363	142.8		14.0	1540	5.050	.150	.140	358.5
16	1020	1488	156.0		17.0	1870	5.950	.180	.174	422.5
17	1090	1590	166.6		20.8	2288	7.100	.215	.204	504.0
18	1200	1751	183.5	110	26.4	2904	8.450	0.259	0.235	600.0

REMARKS —

VENTURI NOZZLE ON DISCHARGE DUCT.

AREA OF THROAT 0.21 SQ. FT.

MOTOR # 5-S-3976

H.P. 5

P_A	V_A	V_D	H_A	V_S	C_E	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
1.77	1.78	0.127	65.35	2.855	2.24	0.1636	0.235	0.0194	59.2	8.27
2.13	2.13	.152	78.98	3.129	2.46	.1795	.285	.0258	588	9.05
2.77	2.77	.198	94.57	3.568	2.80	.2045	.320	.0252	57.8	11.00
3.20	3.13	.223	112.42	3.790	2.97	.2171	.385	.0444	59.7	11.53
3.76	3.55	.254	134.02	4.040	3.17	.2314	.485	.0564	57.9	11.63
4.62	4.40	.315	161.83	4.495	3.58	.2580	.595	.0759	55.4	12.75
5.47	5.33	.381	192.85	4.945	3.88	.2834	.725	.0993	58.4	13.70
6.41	6.39	.457	230.46	5.420	4.25	.3105	.910	.1302	60.8	14.31
7.95	7.67	.549	267.50	5.940	4.66	.3400	1.030	.1654	59.2	16.05
9.66	9.37	.670	319.13	6.560	5.15	.3760	1.252	.2180	58.9	17.41
10.65	9.94	.711	369.86	6.760	5.31	.3870	1.520	.2604	58.4	17.13
12.78	12.35	.883	436.16	7.080	5.56	.4060	1.870	.3315	57.7	17.74
15.26	14.49	1.036	520.30	8.160	6.41	.4675	2.260	.4420	60.4	19.56
18.39	16.70	1.194	619.58	8.760	6.88	0.5020	2.950	0.5650	59.3	19.15

TEST OF STD. BLADE RUNNER		SUCTION-ORIFICE INCHES.	4	DATE	2-21-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	53
WIDTH - RUNNER INCHES.	9	MOTOR № 15-4112 H.P.	3/4	BAROMETER	29.78
NUMBER OF VANES.	6	WET BULB 66° DRY BULB.	78°	PULLEY RATIO	0.655

N	M	B	P_H	E	I	W	S	P	V	S_A
3	460	288.	30.1	110	1.80	198	0.230	0.017	0.017	16.33
4	540	338.	35.3		1.95	209	.320	.025	.025	22.72
5	630	393.	41.2		2.05	226	.425	.033	.033	30.17
6	710	444	46.5		2.25	248	.550	.043	.042	39.05
7	790	494	51.7		2.50	275	.685	.054	.053	48.63
8	885	553	57.9		2.85	314	.845	.065	.063	60.00
9	975	609	63.7		3.20	352	1.020	.079	.076	72.40
10	1085	678	71.0		3.80	418	1.210	.100	.095	90.20
11	1160	725	75.9		4.25	468	1.470	.115	.112	104.40
12	1260	787	81.4		5.25	578	1.760	.139	.133	125.00
13	1320	825	86.3		5.70	627	1.905	.150	.144	135.20
14	1400	875	91.5	110	6.60	726	2.110	0.165	.158	149.80

REMARKS -

VENTURI NOZZLE ON DISCHARGE DUCT.

AREA OF THROAT 0.21 SQ. FT.

MOTOR # 15-4112

H.P. 3/4

P_a	V_a	V_o	H_a	V_f	C_f	#/SEC.	H.P. IN	H.P. OUT	M.E %	EFF %
1.21	1.207	0.085	17.63	2.34	1.836	0.1340	0.084	0.00423	62.7	5.03
1.78	1.775	.127	24.63	2.86	2.242	.1636	.115	.00730	63.7	6.35
2.43	2.342	.168	32.68	3.28	2.575	.1880	.148	.01118	62.0	7.56
3.05	2.980	.213	42.31	3.70	2.905	.2120	.180	.01633	63.0	9.08
3.83	3.762	.269	52.73	4.16	3.270	.2385	.214	.02287	63.6	10.68
4.62	4.475	.320	64.94	4.54	3.560	.2600	.253	.03072	62.5	12.15
5.61	5.355	.383	78.39	4.97	3.900	.2844	.295	.04060	62.2	13.76
7.10	6.725	.481	97.78	5.56	4.365	.3190	.359	.05670	62.5	15.80
8.17	7.950	.569	113.14	6.05	4.755	.3465	.384	.07130	63.3	18.57
9.87	9.440	.677	135.55	6.60	5.180	.3780	.470	.09320	65.9	19.83
10.65	10.230	.732	146.58	6.86	5.380	.3930	.511	.10480	63.4	20.53
11.72	11.220	0.802	162.32	7.18	5.640	0.4115	.572	.12140	62.5	21.23

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	4	DATE	2-21-11
DIAMETER — FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	53.
WIDTH RUNNER INCHES.	9	MOTOR #5-S-3976 H. P.	5	BAROMETER	29.78
NUMBER OF VANES.	6	WET BULB 66° DRY BULB.	78°	PULLEY RATIO	1.458

N	M	B	P_h	E	I	W	S	P	V	S_a
5	390	569	59.6	110	5.0	550	0.850	0.066	0.064	63.5
6	420	613	64.3		5.3	583	1.025	.080	.078	72.8
7	465	678	71.1		5.5	605	1.235	.096	.094	87.7
8	505	737	77.3		5.9	650	1.470	.115	.112	104.4
9	560	817	85.6		6.5	715	1.735	.138	.132	123.2
10	615	897	94.0		7.2	792	2.120	.168	.161	150.5
11	670	977	102.4		8.1	891	2.510	.200	.190	178.3
12	725	1057	110.7		9.2	1012	2.960	.234	.222	210.2
13	780	1137	119.2		10.3	1133	3.450	.272	.260	245.0
14	855	1246	130.6		12.0	1320	4.100	.325	.315	291.0
15	930	1356	142.2		14.2	1562	4.800	.380	.367	340.9
16	1010	1473	154.5		17.0	1870	5.640	.425	.425	400.5
17	1080	1575	165.1		20.2	2222	6.550	.535	.510	465.0
18	1190	1735	182.0	110	26.5	2880	8.050	0.629	0.595	571.5

REMARKS—

VENTURI NOZZLE ON DISCHARGE DUCT.

AREA OF THROAT. 0.21 SQ. FT.

MOTOR #55-3976

H.P. 5

PA	VA	VD	HA	VS	CF	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
4.65	4.53	0.325	68.48	4.57	3.59	0.262	0.225	0.033	62.1	14.50
5.68	5.54	.396	77.78	5.04	3.96	.289	.300	.041	60.5	13.60
6.82	6.68	.477	95.00	5.53	4.34	.327	.330	.058	60.5	16.58
8.17	7.95	.568	113.14	6.05	4.75	.347	.415	.071	61.0	17.18
9.80	9.37	.670	133.67	6.56	5.15	.376	.515	.091	58.8	17.75
11.93	11.43	.818	163.25	7.25	5.69	.416	.630	.123	59.5	19.56
14.20	1349	.965	193.47	7.88	6.18	.451	.750	.160	59.4	21.32
16.62	15.76	1.126	218.95	8.51	6.68	.488	.910	.194	57.7	21.33
19.31	18.46	1.320	265.63	9.22	7.24	.538	1.030	.255	58.1	2480
23.08	22.37	1.600	315.68	10.15	7.96	.582	1.252	.334	59.8	2670
27.00	26.06	1.865	369.77	10.96	8.60	.628	1.535	.424	589	27.50
30.19	30.19	2.160	432.85	11.80	9.25	.675	1.870	.532	58.4	2845
38.00	36.20	2.590	505.59	12.90	10.13	.740	2.255	.680	59.7	30.15
44.65	42.25	3.020	619.17	1394	10.95	0.799	2.920	.899	60.2	3080

TEST OF STR BLADE RUNNER		SUCTION ORIFICE INCHES.	5	DATE.	3-1-11
DIAMETER - FAN INCHES.	24	DIAMETER-DISCHARGE DUCT-INCH.	12	HUMIDITY %.	56
WIDTH - RUNNER INCHES.	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER.	29.175
NUMBER OF VANES.	6	WET BULB 73° DRY BULB.	85°	PULLEY RATIO.	0.655

N	M	B	P_H	E	I	W	S	P	V	S_A
4	530	347	36.35	110	1.80	198	0.276	0.047	0.047	19.6
5	620	406	42.50		2.00	220	.375	.064	.064	26.6
6	710	465	48.75		2.15	237	.490	.083	.081	34.8
7	800	524	54.90		2.50	275	.620	.105	.102	44.0
8	890	583	61.10		2.85	314	.780	.133	.129	54.4
9	970	637	66.70		3.30	363	.915	.156	.151	65.0
10	1080	718	75.20		3.90	429	1.130	.194	.185	80.2
11	1160	771	80.80		4.30	473	1.293	.223	.214	91.8
12	1220	811	85.00		5.20	572	1.500	.259	.247	106.5
13	1290	858	89.90		5.90	649	1.700	.290	.278	120.7
14	1360	904	94.70	110	6.90	759	1.865	0.322	0.311	132.4

REMARKS —

VENTURI NOZZLE ON DISCHARGE

AREA OF THROAT 0.21 SQ. FT.

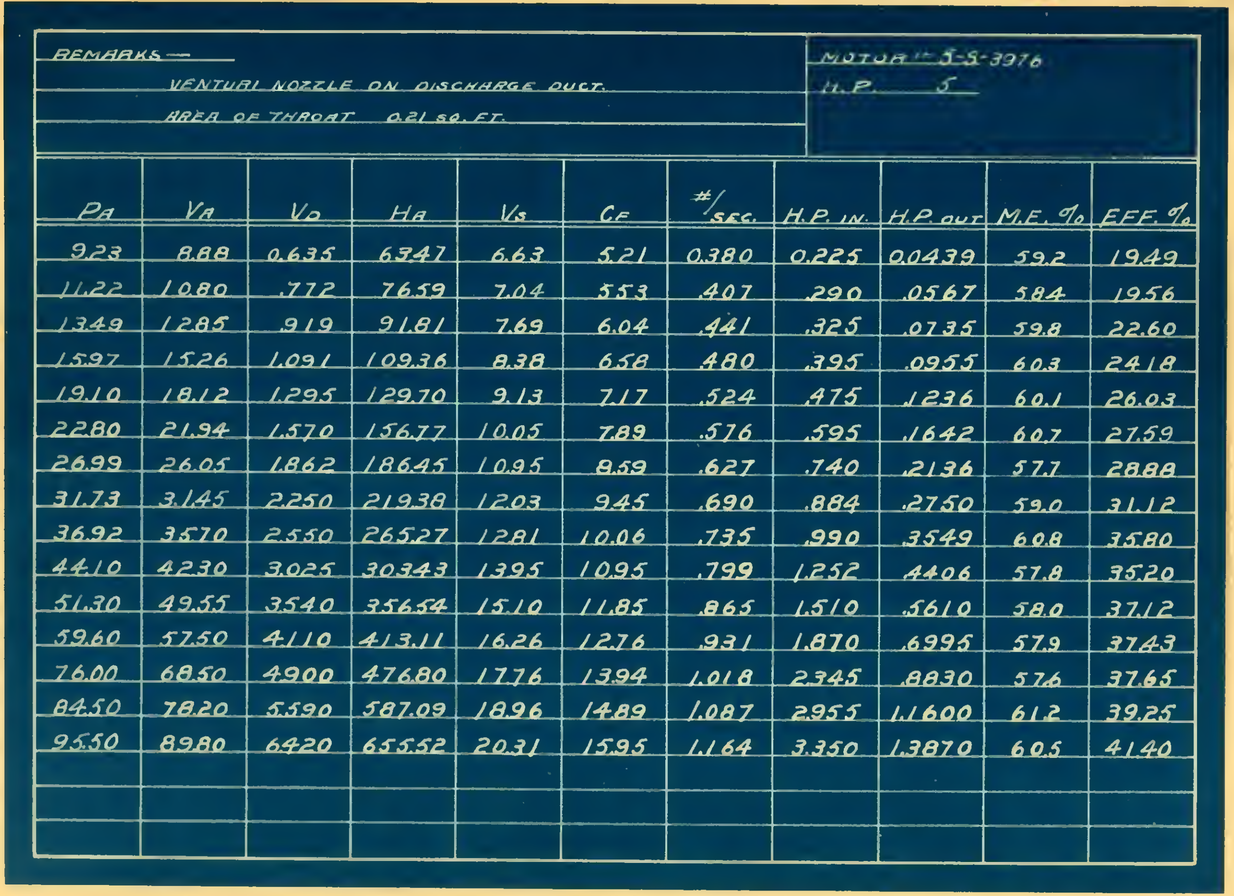
MOTOR # 15-4112

H.P. 3/4

P_A	V_A	V_D	H_A	V_S	C_F	#/SEC	H.P. IN.	H.P. OUT	M.E. %	EFF. %
3.338	3.338	0.239	23.18	3.915	3.07	0.2243	0.100	0.0094	56.5	9.41
4.545	4.545	.325	31.50	4.570	3.59	.2620	.140	.0150	56.1	10.71
5.895	5.710	.409	41.11	5.125	4.03	.2940	.166	.0220	55.7	13.25
7.455	7.240	.518	52.00	5.775	4.53	.3310	.214	.0313	55.5	14.63
9.440	9.160	.655	65.50	6.490	5.09	.3720	.253	.0442	56.5	17.47
11.070	10.720	.766	76.84	7.020	5.51	.4034	.308	.0562	55.6	18.26
13.780	13.140	.940	94.92	7.780	6.10	.4455	.369	.0785	54.1	21.26
15.840	15.200	1.087	108.73	8.360	6.56	.4790	.390	.0947	53.7	24.28
18.390	17.540	1.254	126.14	8.980	7.05	.5145	.466	.1180	56.2	25.34
20.590	19.750	1.412	142.70	9.530	7.49	.5460	.528	.1417	56.9	26.85
22.760	22.090	1.580	156.74	10.090	7.91	0.5780	0.597	0.1647	56.3	27.59

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	5	DATE	3-1-11
DIAMETER – FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %	56
WIDTH – RUNNER INCHES.	9	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.175
NUMBER OF VANES	6	WET BULB 73° DRY BULB	85°	PULLEY RATIO.	1.458.

N	M	B	P_b	E	I	W	S	P	V	S_a
5	385	561	58.8	110	5.00	550	0.755	0.130	0.125	53.6
6	425	620	65.0		5.25	577	.910	.158	.152	64.6
7	460	671	70.3		5.50	605	1.090	.190	.181	77.4
8	500	729	76.4		5.75	633	1.300	.225	.215	92.3
9	545	795	83.4		6.25	687	1.540	.269	.255	109.3
10	600	875	91.7		7.00	770	1.865	.321	.309	132.4
11	660	963	102.0		8.00	880	2.220	.380	.367	157.6
12	715	1043	109.4		9.00	990	2.610	.447	.443	185.4
13	775	1130	118.5		10.00	1100	3.180	.520	.503	225.8
14	850	1240	130.0		12.00	1320	3.610	.621	.593	256.3
15	920	1342	140.7		14.00	1540	4.250	.723	.698	301.7
16	990	1444	151.5		17.00	1870	4.930	.840	.810	350.0
17	1070	1560	163.6		21.00	2310	5.575	1.070	.965	395.9
18	1150	1676	175.7		26.50	2915	7.000	1.190	1.120	497.0
19	1220	1780	186.6	110	35.00	3350	7.800	1.345	1.265	553.6



REMARKS —

VENTURI NOZZLE ON DISCHARGE DUCT.

AREA OF THROAT 0.21 SQ. FT.

MOTOR # 5-S-3976

H.P. 5

Pa	Va	Vo	Ha	Vs	Cf	#/sec.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
9.23	8.88	0.635	63.47	6.63	5.21	0.380	0.225	0.0439	59.2	19.49
11.22	10.80	.772	76.59	7.04	5.53	.407	.290	.0567	58.4	19.56
13.49	12.85	.919	91.81	7.69	6.04	.441	.325	.0735	59.8	22.60
15.97	15.26	1.091	109.36	8.38	6.58	.480	.395	.0955	60.3	24.18
19.10	18.12	1.295	129.70	9.13	7.17	.524	.475	.1236	60.1	26.03
22.80	21.94	1.570	156.77	10.05	7.89	.576	.595	.1642	60.7	27.59
26.99	26.05	1.862	186.45	10.95	8.59	.627	.740	.2136	57.7	28.88
31.73	3.145	2.250	219.38	12.03	9.45	.690	.884	.2750	59.0	31.12
36.92	35.70	2.550	265.27	12.81	10.06	.735	.990	.3549	60.8	35.80
44.10	42.30	3.025	303.43	13.95	10.95	.799	1.252	.4406	57.8	35.20
51.30	49.55	3.540	356.54	15.10	11.85	.865	1.510	.5610	58.0	37.12
59.60	57.50	4.110	413.11	16.26	12.76	.931	1.870	.6995	57.9	37.43
76.00	68.50	4.900	476.80	17.76	13.94	1.018	2.345	.8830	57.6	37.65
84.50	78.20	5.590	587.09	18.96	14.89	1.087	2.955	1.1600	61.2	39.25
95.50	89.80	6.420	655.52	20.31	15.95	1.164	3.350	1.3870	60.5	41.40

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	6	DATE.	3-3-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH.	12	HUMIDITY %.	41.7
WIDTH - RUNNER INCHES.	9	MOTOR # 15-4112 H.P.	3/4	BAROMETER.	29.42
NUMBER OF VANES.	6	WET BULB. 65° DRY BULB.	81°	PULLEY RATIO.	0.655

N	M	B	P_H	E	I	W	S	P	V	S_A
3	450	281	28.43	110	1.70	187	0.185	0.062	0.061	13.13
4	525	328	34.35		1.75	193	.255	.081	.080	18.10
5	615	385	40.25		1.90	209	.340	.112	.109	24.13
6	705	450	47.00		2.10	231	.443	.144	.140	31.45
7	795	497	52.05		2.40	264	.570	.184	.181	40.50
8	900	563	58.90		2.75	303	.715	.230	.226	50.75
9	990	619	64.80		3.20	352	.855	.274	.269	60.70
10	1090	685	71.70		3.85	424	1.040	.334	.330	73.82
11	1190	744	77.90		4.75	523	1.240	.400	.390	88.00
12	1230	769	80.50		5.45	599	1.405	.451	.442	99.80
13	1300	813	85.10		6.10	671	1.543	.495	.485	109.50
14	1370	857	89.70	110	7.20	782	1.655	0.544	0.534	117.50

REMARKS —
VENTURI NOZZLE ON DISCHARGE
AREA OF THROAT 0.21 SQ. FT.

MOTOR # 15-4112
H.P. 3/4

P_A	V_A	V_D	H_A	V_S	C_F	#/SEC	H.P. IN	H.P. OUT	M.E. %	EFF %
4.40	4.33	0.310	17.84	4.463	3.50	0.256	0.068	0.0083	66.3	12.20
5.75	5.68	.406	24.26	5.110	4.01	.293	.093	.0129	66.2	13.89
7.96	7.74	.553	32.42	5.960	4.68	.342	.125	.0202	64.4	16.12
10.22	9.94	.711	42.10	6.760	5.31	.387	.159	.0297	61.4	18.65
13.06	12.85	.919	54.27	7.185	6.03	.440	.201	.0435	64.7	21.60
16.32	16.05	1.147	67.95	8.220	6.44	.472	.240	.0572	63.1	23.84
19.45	19.10	1.365	81.52	9.370	7.36	.537	.320	.0793	62.3	24.80
23.70	23.43	1.603	98.85	10.160	7.97	.582	.365	.1046	61.9	28.67
28.40	27.70	1.980	117.68	11.290	8.86	.647	.435	.1384	62.5	31.80
32.03	31.38	2.244	133.42	12.020	9.43	.688	.488	.1680	66.3	34.34
35.14	34.44	2.462	146.40	12.590	9.88	.722	.545	.1922	65.1	35.30
37.93	37.90	3.710	159.11	15.450	12.12	0.885	0.621	0.2560	63.7	41.20

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	6	DATE	3-3-11
DIAMETER - FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	41.7
WIDTH - RUNNER INCHES	9	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.42
NUMBER OF VANES	6	WET BULB 65° DRY BULB	81°	PULLEY RATIO.	1.458

N	M	B	P_h	E	I	W	S	P	V	Sa
5	390	569	59.7	110	5.0	550	0.696	0.223	0.220	49.4
6	425	620	65.0		5.2	572	.825	.263	.260	58.6
7	455	664	69.6		5.6	616	.988	.315	.310	70.2
8	500	729	76.5		6.0	660	1.175	.374	.369	76.4
9	545	795	83.3		6.5	715	1.390	.443	.434	88.8
10	595	868	91.0		7.4	814	1.660	.529	.519	117.9
11	655	956	100.0		8.5	935	1.915	.630	.622	136.0
12	715	1043	109.4		9.8	1078	2.260	.745	.735	160.5
13	775	1131	118.5		10.8	1188	2.610	.864	.850	185.4
14	845	1232	129.1		12.7	1397	3.100	1.020	1.013	220.0
15	915	1335	140.0		14.8	1628	3.500	1.172	1.210	248.5
16	985	1437	150.6		17.8	1959	4.100	1.355	1.400	291.0
17	1085	1582	165.9		23.4	2574	4.850	1.650	1.725	344.4
18	1175	1714	179.7		29.3	3224	5.600	1.925	2.000	397.5
19	1210	1765	185.1		36.0	3850	6.430	2.205	2.295	456.5
20	1280	1867	195.8	110	41.4	4554	7.050	2.420	2.520	500.5
21	1330	1940	203.4	109	46.3	5090	7.550	2.575	2.660	536.0

REMARKS –

VENTURI NOZZLE ON DISCHARGE DUCT. AREA THROAT 0.21 SQ. FT.

MOTOR # 5-S-3976

H.P. 5

Pa	Va	Vo	Ha	Vs	Cs	Ps	H.P. IN.	H.P. OUT	M.E. %	EFF. %
15.84	15.62	1.12	66.14	8.47	6.65	0.486	0.225	0.0584	59.4	25.95
18.67	18.45	1.32	78.32	9.22	7.23	.528	.290	.0752	59.7	25.93
22.35	22.02	1.57	93.74	10.07	7.90	.577	.345	0983	62.3	28.50
26.55	26.20	1.87	104.47	10.99	8.62	.630	.430	.1196	57.5	27.83
31.45	30.80	2.20	121.75	11.90	9.34	.682	.515	.1510	56.5	29.33
37.55	36.85	2.63	157.38	13.01	10.22	.746	.655	.2135	61.3	32.60
44.70	44.15	3.16	183.31	14.23	11.16	.815	.810	.2716	59.1	33.55
52.90	52.20	3.72	216.42	15.48	12.15	.887	1.000	.3490	58.3	34.90
61.35	60.35	4.32	250.07	16.65	13.08	.955	1.100	.4340	57.3	39.46
72.45	71.90	5.14	297.07	18.19	14.28	1.042	1.355	.5630	57.4	41.55
83.20	85.95	6.15	340.60	19.90	15.62	1.140	1.610	.7060	56.0	43.85
93.20	99.40	7.11	397.51	21.40	16.79	1.225	2.090	.8850	56.3	42.33
117.20	122.50	8.76	475.66	23.73	18.64	1.360	2.725	1.1750	56.8	43.16
136.60	142.00	10.15	549.65	25.55	20.05	1.464	3.275	1.4620	54.9	44.64
156.50	163.00	11.65	621.15	27.37	21.50	1.570	3.475	1.7720	58.4	51.00 ?
171.90	178.90	12.79	692.19	28.67	22.50	1.643	4.405	2.0700	58.1	47.00
182.80	188.90	13.50	738.40	29.45	23.13	1.688	4.820	2.2670	57.5	47.15

TEST OF STR. BLADE RUNNER		SUCTION-ORIFICE INCHES.	7	DATE	3-3-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %.	41.5
WIDTH-RUNNER INCHES.	9	MOTOR #15-4112 H.P.	3/4	BAROMETER	29.42
NUMBER OF VANES.	6	WET BULB 65° DRY BULB. 81°		PULLEY RATIO.	0.655

N	M	B	R	E	I	W	S	P	V	Sa
3	455	298	31.2	110	1.70	187	0.150	0.083	0.083	10.65
4	525	344	36.1		1.85	203	.205	.120	.117	14.55
5	615	403	42.2		2.00	220	.275	.160	.157	19.52
6	705	462	48.4		2.25	247	.356	.206	.203	25.27
7	795	521	54.6		2.55	281	.450	.260	.256	31.95
8	890	583	61.0		3.00	330	.560	.325	.319	39.75
9	980	642	67.2		3.45	379	.679	.392	.383	48.20
10	1085	711	74.5		4.10	451	.820	.477	.467	58.20
11	1175	770	80.7		4.85	534	.960	.555	.545	68.15
12	1240	812	85.1		5.90	649	1.135	.657	.649	80.60
13	1300	852	89.3	110	6.75	742	1.250	0.725	0.711	88.80
				LARGE	MOTOR					
5	375	547	57.3	110	5.0	550	0.550	0.316	0.313	39.05
6	420	613	64.3		5.3	583	.655	.383	.375	46.05
7	460	671	70.3		5.7	627	.800	.460	.452	56.80
8.	500	729	76.5	110	6.2	682	0.955	0.550	0.540	67.80

REMARKS—

VENTURI NOZZLE ON DISCHARGE

AREA OF THROAT 0.21 SQ. FT.

MOTOR # 15-4112

H.P. 3/4

P_a	V_a	V_o	H_a	V_s	C_E	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
5.89	5.89	0.421	16.96	5.98	4.08	0.298	0.068	0.0092	56.2	13.52
8.52	8.31	.594	23.64	6.18	4.86	.355	.107	.0152	60.3	14.24
11.36	11.15	.798	31.68	7.16	5.62	.411	.141	.0236	57.3	16.75
14.62	14.42	1.031	40.92	8.14	6.40	.467	.180	.0348	56.2	19.30
18.46	18.18	1.300	51.71	9.15	7.18	.524	.220	.0493	55.9	22.41
23.09	22.65	1.619	64.46	10.21	8.02	.585	.271	.0685	56.3	25.60
27.83	27.20	1.944	77.97	11.18	8.78	.652	.326	.0909	55.5	27.90
38.86	33.15	2.372	99.43	12.34	9.69	.707	.392	.1277	57.7	32.60
39.40	38.70	2.770	110.32	13.34	10.47	.764	.445	.1532	54.6	34.40
46.65	46.10	3.295	130.55	14.56	11.43	.834	.529	.1981	58.1	37.46
51.46	50.45	3.608	143.87	15.21	12.21	0.892	0.602	0.2332	58.1	38.75
				LARGE	MOTOR					
22.44	22.23	1.589	63.08	10.11	7.94	0.579	0.225	0.0664	59.8	29.50
27.20	26.63	1.904	75.60	11.07	8.69	.634	.305	.0872	55.1	26.45
32.67	32.10	2.295	91.77	12.14	9.54	.696	.360	.1161	56.6	32.25
39.06	38.34	2.743	109.60	13.28	10.42	0.761	0.460	0.1576	57.3	32.80

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES	7	DATE	3-3-11
DIAMETER - FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	41.5
WIDTH RUNNER INCHES	8	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.42
NUMBER OF VANES	6	WET BULB 65° DRY BULB	81°	PULLEY RATIO.	1.458

N	M	B	Pa	E	I	W	S	P	V	Sa
5	375	547	57.3	110	5.2	572	.865	0.008	0.035	61.4
6	415	605	63.5		5.5	605	1.040	.009	.044	738
7	460	671	70.3		5.8	638	1.250	.010	.055	88.8
8	505	737	77.3		6.5	715	1.480	.011	.064	1051
9	550	802	84.1		7.2	792	1.725	.012	.077	1224
10	605	880	92.5		8.2	902	2.060	.014	.091	146.2
11	665	970	101.6		9.5	1045	2.410	.015	.111	171.1
12	725	1057	110.8		11.3	1243	2865	.016	.133	203.5
13	785	1145	120.0		12.6	1386	3.320	.020	.153	225.8
14	860	1254	131.5		15.4	1694	3.930	.024	.183	279.0
15	935	1363	1430		18.9	2080	4.620	.026	.215	3280
16	1010	1473	154.5		22.8	2509	5.290	.030	.250	375.0
17	1075	1568	164.5		27.5	3050	6.050	.032	.283	429.5
18	1160	1692	177.4	110	34.0	3740	6980	.034	.327	4958
19	1210	1765	1850	109	39.0	4250	7.750	0.040	0.366	550.0

REMARKS—

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT.

AREA DUCT 0.7854 SQ.FT.

MOTOR No 5-S-3976

H.P. 5

PA	VA	VO	HA	VS	CE	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.568		2.48	64.45	12.64	9.93	0.725	0.255	0.085	63.2	33.65
.639		2.87	77.31	13.58	10.66	.779	.330	.104	61.7	31.45
.710		3.87	93.33	15.78	12.38	.905	.375	.154	60.8	40.95
.781		4.55	110.43	17.10	13.42	.980	.500	.197	59.5	39.30
.852		5.47	127.72	18.76	14.72	1.075	.605	.250	58.2	41.25
.994		6.46	153.65	20.40	16.02	1.169	.775	.327	57.9	42.15
1.065		7.88	180.04	22.52	17.68	1.292	.950	.423	56.1	44.54
1.136		9.45	214.08	24.68	19.36	1.414	1.210	.550	56.1	45.45
1.420		10.86	238.08	26.42	20.73	1.514	1.335	.655	53.2	49.05
1.704		12.99	293.69	28.90	23.18	1.692	1.706	.904	54.7	53.00
1.846		15.26	345.11	31.31	24.59	1.794	2.120	1.126	54.3	53.10
2.130		17.75	395.48	33.80	26.50	1.935	2.660	1.391	53.4	52.30
2.273		20.10	451.87	35.97	28.21	2.060	3.115	1.692	53.8	54.30
2.415		23.22	521.44	38.65	30.35	2.214	3.795	2.089	53.3	55.30
2.840		25.99	578.83	40.88	32.10	2.342	4.255	2.465	54.5	57.90

TEST OF STRAIGHT BLADE RUNNER		SUCTION ORIFICE INCHES	8	DATE	3-10-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	41.0
WIDTH-RUNNER INCHES.	9	MOTOR #15-4112 H.P.	3/4	BAROMETER	29.49
NUMBER OF VANES.	6	WET BULB 62° DRY BULB	76.5°	PULLEY RATIO.	0.655

N	M	B	P_A	E	I	W	P	S	V	S_A
3	455	298	31.2	110	1.90	209	0.001	0.193	0.015	13.71
4	535	350	36.7		2.05	226	.001	.265	.023	18.82
5	620	406	42.5		2.25	247	.002	.360	.030	25.55
6	710	465	48.7		2.60	286	.004	.470	.040	33.36
7	800	524	54.8		3.05	336	.005	.602	.051	42.75
8	895	586	61.3		3.55	391	.006	.759	.063	53.90
9	980	642	67.2		4.20	462	.007	.900	.076	63.90
10	1085	710	74.3		5.15	561	.009	1.100	.095	78.10
11	1160	760	79.6		5.90	649	.010	1.235	.105	87.70
12	1210	793	83.1		6.60	726	.011	1.350	.115	95.45
13	1275	835	87.5	110	7.65	842	0.012	1.520	0.130	107.90

REMARKS –

VENTURI NOZZLE REMOVED. FROM DISCHARGE.

AREA OF DUCT 0.7854 sq. FT.

MOTOR # 15-A112

H.P. 3/4

P_A	V_D	V_B	H_A	V_S	C_F	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.071	1.065		14.85	8.28	6.50	0.475	0.099	0.0128	49.2	1294
.071	1.634		21.16	10.25	8.04	.588	.136	.0226	50.7	16.62
.142	2.130		27.82	11.71	9.19	.671	.177	.0400	49.6	22.60
.284	2.840		36.48	13.52	10.61	.775	.226	.0514	49.5	2274
.355	3.620		46.73	15.26	1198	.875	.280	.0743	51.2	26.54
.426	4.474		58.80	16.96	13.32	.973	.336	.1040	50.4	3096
.497	6.396		69.80	18.63	14.62	1.068	.413	.1355	49.8	32.80
.639	6.745		8449	20.82	16.35	1.194	.500	.1833	49.3	36.67
.710	7.455		95.87	21.91	17.20	1.252	.541	.2190	48.8	40.45
.788	8.160		10440	22.62	18.00	1.313	.590	.2495	48.7	42.30
0.852	9.230		117.98	24.37	19.14	1.397	0.673	0.2995	49.6	43.85

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	8	DATE	3-10-11
DIAMETER – FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %.	41.0
WIDTH – RUNNER INCHES.	9	MOTOR #5-S-3976 H.P.	5	BAROMETER	29.49.
NUMBER OF VANES.	6	WET BULB 62 DRY BULB 76.5		PULLEY RATIO.	1.458.

N	M	B	P_h	E	I	W	S	P	V	S_a
5	375	547	57.4	110.0	5.5	605	0.735	0.006	0.063	52.2
6	415	606	63.6		5.8	638	.870	.007	.075	61.8
7	455	664	69.7		6.4	704	1.050	.009	.088	74.6
8	495	722	75.7		6.9	759	1.235	.010	.105	87.7
9	535	781	81.9		7.7	847	1.495	.012	.130	106.2
10	600	875	91.8		8.8	968	1.835	.015	.158	130.3
11	660	963	101.0		10.0	1102	2.185	.017	.187	155.1
12	720	1050	110.1		12.0	1210	2.610	.021	.220	185.4
13	775	1131	118.6		14.0	1540	3.100	.025	.261	220.2
14	855	1246	130.6		17.2	1892	3.700	.029	.311	262.7
15	935	1364	143.0		20.8	2289	4.350	.033	.362	308.9
16	1010	1474	154.6		26.0	2860	4.950	.040	.410	351.5
17	1075	1568	164.5	110.0	31.5	3465	5.600	.044	.483	397.5
18	1160	1692	177.5	109.0	38.5	4195	6.500	.050	.552	461.5
19	1210	1765	185.2	109.0	44.2	4820	7.100	.056	.602	504.0
20	1240	1810	190.0	108.5	48.5	5285	7.450	0.059	0.622	529.0

REMARKS—

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT.

AREA OF DUCT = 0.7854 sq. FT.

MOTOR #

H.P. 5.

Pa	Va	Vo	Hh	Vs	Cf	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.426		4.475	57.11	16.97	13.32	0.973	0.295	0.101	55.8	34.2
.497		5.325	67.59	18.51	14.53	1.061	.375	.131	53.8	34.7
.639		6.320	81.51	20.15	15.82	1.155	.460	.171	54.0	37.2
.710		7.455	95.87	21.90	17.20	1.252	.560	.210	53.9	37.5
.852		9.230	116.28	24.37	19.14	1.397	.685	.296	55.8	43.2
1.065		11.220	142.59	26.86	21.10	1.539	.855	.374	54.5	43.7
1.207		13.280	169.59	29.22	22.93	1.674	1.020	.517	53.5	50.7
1.491		15.620	202.51	31.70	24.90	1.817	1.165	.669	53.8	57.4
1.775		18.540	240.52	34.53	27.10	1.978	1.525	.865	55.0	56.7
2.060		22.090	286.85	37.67	29.60	2.160	1.935	1.125	52.2	58.1
2.343		25.700	336.95	40.63	31.90	2.328	2.470	1.427	51.5	60.2
2.840		29.110	383.45	43.25	33.95	2.480	2.945	1.729	51.7	62.1
3.123		34.300	434.92	47.00	36.95	2.697	3.540	2.134	51.8	60.3
3.550		39.200	504.25	50.20	39.42	2.878	4.200	2.640	51.5	62.9
3.975		42.750	550.73	52.42	41.20	3.007	4.740	3.013	51.8	63.6
4.190		44.160	577.35	53.20	41.80	3.053	5.060	3.202	51.4	63.3

TEST OF STD. BLADE RUNNER		SUCTION ORIFICE INCHES	9	DATE	3-10-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	42
WIDTH-RUNNER INCHES.	9	MOTOR # 15-4112 H. P.	3/4	BAROMETER	29.45
NUMBER OF VANES	6	WET BULB 62° DRY BULB.	77°	PULLEY RATIO.	0.655

N	M	B	Pn	E	I	W	S	P	V	Sa.
3	440	288	30.2	110	1.75	193	0.170	0.002	0.024	12.07
4	530	374	36.4		1.85	204	.241	.003	.033	17.11
5	615	403	42.2		2.10	231	.334	.004	.045	23.70
6	706	462	48.4		2.40	264	.435	.005	.058	30.89
7	785	514	53.8		2.80	308	.552	.007	.074	39.19
8	885	580	60.7		3.35	369	.690	.009	.094	49.00
9	976	638	66.8		4.05	446	.830	.010	.113	58.90
10	1070	701	73.4		4.85	534	.995	.013	.134	70.65
11	1145	750	78.6		5.80	638	1.100	.015	.154	78.10
12	1210	793	83.1		6.90	759	1.235	.016	.173	87.70
13	1245	816	85.5	110	7.45	819	1.340	0.017	.185	95.15

REMARKS—

VENTURI NOZZLE REMOVED FROM DISCHARGE.

AREA OF DUCT 0.7854 SQ. FT.

MOTOR # 15-4112

H.P. 3/4.

P_A	V_A	V_D	H_A	V_S	C_F	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.142		1.704	1492	10.46	8.22	0.600	0.061	0.0164	52.8	26.84
.213		2.343	19.67	12.28	9.64	.704	.107	.0252	48.0	2446
.284		3.195	27.18	14.33	11.25	.821	.155	.0458	49.2	29.55
.355		4118	35.36	16.26	12.76	.932	.200	.0599	48.6	29.95
.497		5.250	44.74	18.36	14.41	1.052	.250	.0856	498	34.23
.639		6.675	56.31	20.72	16.27	1.188	.313	.1216	49.2	38.86
.710		8.250	67.86	23.05	18.08	1.320	.396	.1629	49.0	41.15
.923		9.515	81.09	24.73	19.42	1.417	.470	.2190	48.5	44.50
1.065		10.930	90.10	26.52	2082	1.520	.532	.2490	47.0	46.80
1.136		12290	101.13	28.10	22.05	1.610	.616	.2958	47.2	48.05
1.206		13.140	109.50	29.08	22.81	1.664	0.642	0.3315	48.2	51.60

TEST OF CURVED BLADE RUNNER		SUCTION ORIFICE INCHES.	9	DATE	2-11-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %.	47
WIDTH-RUNNER INCHES	9	MOTOR # 5-S-3976H.P.	5	BAROMETER	29.70
NUMBER OF VANES.	6	WET BULB 54° DRYBULB	64°	PULLEY RATIO.	1.458

N	M	B	Pn	E	I	W	S	P	V	Sa
4	370	539	56.4	110	6.0	660	.825	0.009	0.098	58.6
5	395	576	60.3		6.0	660	.950	.010	.113	67.5
6	430	627	65.7		6.5	710	1.140	.011	.135	81.0
7	480	700	73.3		7.0	770	1.370	.012	.165	97.3
8	520	758	79.4		8.2	902	1.640	.014	.198	116.5
9	565	825	86.4		9.0	990	1.942	.015	.234	137.9
10	625	917	95.4		10.7	1177	2.385	.020	.284	169.4
11	675	984	103.0		12.5	1375	2.835	.022	.349	201.4
12	730	1075	112.5		15.0	1650	3.350	.026	.413	237.9
13	790	1162	121.6		17.7	1947	3.900	.030	.480	277.0
14	870	1268	132.8		22.5	2475	4.620	.035	.570	328.0
15	945	1390	145.5		28.3	3113	5.350	.040	.660	380.0
16	1000	1458	152.6		33.4	3675	6.000	.045	.730	426.0
17	1050	1532	164.0	110	38.5	4200	6.550	0.049	0.810	465.0

REMARKS– VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT AREA OF DUCT 0.7854 SQ. FT.	MOTOR #5-5-3976 H.P. 5

P_A	V_A	V_D	H_A	V_F	C_F	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
0.639		6.96	66.20	21.18	16.62	1.214	0.340	0.1461	67.0	43.0
.710		8.03	79.19	22.73	17.85	1.304	.375	.1877	70.0	50.0
.781		9.59	91.37	24.85	19.50	1.424	.470	.2365	68.2	50.3
.852		11.72	109.87	27.45	21.55	1.573	.550	.3140	65.8	57.1
.994		14.06	131.55	30.08	23.60	1.724	.735	.4129	67.2	56.2
1.065		16.62	155.59	32.70	25.68	1.874	.865	.5310	68.6	61.3
1.420		20.17	190.99	36.00	28.27	2.062	1.110	.7510	69.1	67.7
1.562		24.78	227.74	39.90	30.34	2.288	1.355	.9460	68.3	69.8
1.846		29.33	268.18	43.40	34.09	2.488	1.710	1.2140	68.2	71.0
2.130		34.10	313.23	46.82	36.75	2.682	2.020	1.5280	67.8	75.7
2.485		40.47	370.96	51.00	40.04	2.922	2.605	1.9700	65.4	75.7
2.840		46.86	429.10	54.90	43.10	3.145	3.235	2.4590	66.5	76.0
3.195		51.81	481.01	57.75	45.35	3.310	3.670	2.8950	63.1	78.9
3.480		57.50	526.34	60.82	47.75	3.487	4.265	3.3350		78.2

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES	10	DATE	3-10-11
DIAMETER-FAN INCHES.	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	46
WIDTH-RUNNER INCHES	9	MOTOR #13-4112 H.P.	3/4	BAROMETER	29.44
NUMBER OF VANES.	6	WET BULB 65° DRY BULB.	79°	PULLEY RATIO.	0.655

N	M	B	P_h	E	I	W	S	P	V	S_A
3	440	288	30.2	110	1.80	198	0.146	0.002	0.031	10.36
4	525	344	36.1		1.95	215	.210	.004	.045	14.91
5	620	406	42.5		2.25	247	.290	.005	.060	20.60
6	705	462	48.4		2.60	286	.378	.007	.080	26.84
7	795	521	54.6		3.00	330	.477	.009	.100	33.86
8	890	583	61.1		3.65	402	.605	.011	.125	42.95
9	975	639	67.0		4.35	479	.710	.013	.149	50.40
10	1080	708	74.2		5.40	594	.870	.015	.181	61.95
11	1160	760	79.6		6.50	715	.960	.019	.204	68.15
12	1210	793	83.1	110	7.60	836	1.060	0.021	0.232	75.30

REMARKS—

VENTURI NOZZLE REMOVED FROM DISCHARGE.

AREA OF DUCT 0.7854 sq. FT.

MOTOR # 15-4112

H.P. 3/4

Pa	Va	Vo	Ha	Vs	Cf	#/SEC.	H.P. IN.	H.P. OUT.	M.E. %	EFF. %
0.142		2.20	12.70	11.90	9.34	0.682	0.084	0.0158	44.8	18.8
.284		3.20	18.39	14.33	11.25	.821	.122	.0275	45.6	22.5
.355		4.26	25.22	16.56	13.00	.949	.177	.0435	45.0	24.6
.497		5.68	33.02	19.11	15.00	1.096	.226	.0637	45.3	28.2
.639		7.10	41.60	21.38	16.78	1.225	.273	.0926	45.0	33.9
.781		8.88	52.61	23.90	18.76	1.370	.348	.1310	45.4	37.7
.923		10.58	61.90	26.10	20.50	1.496	.429	.1681	44.4	39.2
1.065		12.85	75.87	28.74	22.55	1.646	.525	.2273	44.4	43.3
1.349		14.49	83.99	30.53	23.96	1.750	.590	.2764	42.7	45.3
1.491		16.47	93.26	32.57	25.56	1.866	.674	0.3167	43.5	47.0

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES.	10	DATE.	3-10-11
DIAMETER FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %.	46
WIDTH RUNNER INCHES	3	MOTOR # 5-S-3976 H.P.	5	BAROMETER	29.44
NUMBER OF VANES.	6	WET BULB 65° DRY BULB.	79°	PULLEY RATIO.	1458

Δ	N	B	Pn	E	I	W	S	P	V	Sa
5	375	547	57.4	110.0	5.5	605	0.591	0.011	0.124	47.0
6	415	605	63.5		5.8	638	.700	.013	.148	49.7
7	455	664	69.6		6.5	715	.838	.015	.178	59.5
8	495	722	75.7		7.2	792	.960	.019	.202	68.2
9	540	789	82.8		8.2	902	1.165	.023	.246	82.7
10	600	875	91.8		9.8	1078	1.435	.028	.303	101.9
11	655	955	100.2		11.5	1265	1.695	.031	.356	120.3
12	730	1065	111.7		14.0	1540	2.025	.038	.425	143.7
13	775	1130	118.5		15.8	1738	2.340	.045	.500	166.2
14	860	1255	131.7		19.8	2179	2.855	.054	.600	202.8
15	935	1364	143.1		25.5	2805	3.350	.062	.703	237.8
16	1000	1458	153.0		31.0	3410	3.800	.070	.795	269.6
17	1065	1553	163.0	110.0	36.8	4049	4.300	.080	.890	305.4
18	1120	1633	171.3	109.5	43.5	4760	4.870	.088	1.000	345.7
19	1160	1692	177.4	109.0	49.0	5340	5.140	.092	1.050	365.0
20	1190	1736	182.1		53.5	5830	5.360	.095	1.125	380.5
21	1210	1765	184.1	109.0	56.0	6100	5.650	0.097	1.150	401.2

REMARKS-	MOTOR # 5-S-3976
VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT	H.P. 5
AREA OF DISCHARGE 0.7854 SQ. FT.	

Pa	Vo	Va	Ha	Vf	Cf	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
.781	8.81		56.54	23.80	18.69	1.364	0.295	0.1397	55.2	47.35
.923	10.51		61.13	26.00	20.41	1.490	.375	.1654	48.8	44.10
1.065	12.64		73.21	28.50	22.40	1.635	.475	.2178	48.7	46.05
1.349	14.34		83.84	30.36	23.84	1.741	.600	.2655	47.1	44.25
1.632	17.46		101.79	33.55	26.34	1.922	.755	.3560	47.8	47.15
1.988	21.51		125.40	37.20	29.20	2.130	.995	.4860	47.9	48.85
2.202	25.27		147.77	40.33	31.65	2.310	1.220	.6210	47.5	50.90
2.697	30.17		176.57	44.04	34.50	2.522	1.575	.8100	46.6	51.40
3.195	35.50		204.90	47.76	37.50	2.737	1.890	1.0200	47.0	54.00
3.834	42.60		249.23	52.30	41.10	3.000	2.355	1.3600	46.3	57.80
4.400	49.90		292.10	56.60	44.46	3.246	2.935	1.7220	45.9	58.70
4.970	56.42		330.99	60.35	47.36	3.457	3.505	2.0810	45.5	59.40
5.680	63.20		374.28	63.70	50.00	3.652	4.155	2.4850	45.4	59.80
6.248	71.00		422.95	67.55	53.00	3.870	4.765	2.9780	46.4	62.50
6.530	74.55		446.08	69.25	54.35	3.970	5.210	3.2200	45.6	61.80
6.745	79.90		467.15	71.25	56.30	4.112	5.525	3.4950	45.4	63.30
6.885	81.65		489.74	72.40	56.90	4.150	5.640	3.7000	46.5	65.60

TEST OF STR. BLADE RUNNER		SUCTION ORIFICE INCHES	11	DATE	15-4112
DIAMETER – FAN INCHES.	24	DIAMETER – DISCHARGE DUCT INCH.	12	HUMIDITY %	
WIDTH – RUNNER INCHES.	9	MOTOR # H.P.	3/4	BAROMETER	29.37
NUMBER OF VANES.	6	WET BULB 64° DRY BULB.	71°	PULLEY RATIO.	0.655

N	M	B	P_a	E	I	W	S	P	V	Sa.
4	535	351	36.8	110	2.00	220	0.180	0.006	0.045	12.78
5	635	416	43.6		2.30	253	.240	.009	.066	17.05
6	720	472	49.5		2.75	303	.330	.011	.092	23.43
7	815	534	56.0		3.25	357	.410	.014	.119	29.10
8	920	603	63.3		4.05	445	.519	.016	.150	36.85
9	1010	662	69.4		4.95	544	.638	.021	.184	45.30
10	1105	724	75.9		6.35	698	.761	.024	.222	54.00
11	1170	767	80.4	110	7.70	847	0.847	0.028	.250	60.15

REMARKS – VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT. AREA OF DUCT 0.7854 SQ.FT.	MOTOR # 15-4112 H.P. 3/4

P_a	V_a	V_o	H_a	V_F	C_F	#/sec.	H.P. in.	H.P. out.	M.E. %	EFF. %
0.426		3.195	16.40	14.34	11.26	.822	0.129	0.0245	39.0	18.99
.639		4.685	22.37	17.37	13.64	.995	.184	.0450	37.9	22.00
.781		6530	30.74	20.50	16.09	1.175	.245	.0656	40.5	26.79
.994		8450	38.54	23.30	18.30	1.336	.302	.0935	39.6	30.95
1.136		10.650	48.64	26.18	20.55	1.500	.396	.1327	39.1	33.50
1.491		13.060	59.85	28.99	22.76	1.661	.490	.1807	40.0	36.90
1.705		15.760	71.47	31.82	24.99	1.824	.611	.2370	40.0	38.80
1.989		17.750	79.89	33.80	26.53	1.936	0.684	.2814	39.8	41.15

TEST OF STR BLADE RUNNER		SUCTION ORIFICE INCHES.	11	DATE 4-12-11	
DIAMETER – FAN INCHES	24	DIAMETER DISCHARGE DUCT INCH	12	HUMIDITY %	68
WIDTH – RUNNER INCHES.	9	MOTOR # 5-S-397 H.P.	5	BAROMETER	29.37
NUMBER OF VANES.	6	WET BULB 64° DRY BULB.	71°	PULLEY RATIO.	1.458

N	M	B	P_h	E	I	W	S	P	V	S_a
4	359	524	54.9	110	5.5	605	0.410	0.014	0.120	29.1
5	486	563	59.0		5.8	638	.489	.015	.139	35.4
6	410	598	62.7		6.2	682	.580	.019	.168	41.2
7	455	664	69.6		6.9	759	.705	.022	.204	50.0
8	500	729	76.5		7.7	847	.810	.027	.240	57.5
9	545	795	83.3		8.8	968	.970	.031	.283	68.9
10	600	875	91.8		10.3	1133	1.205	.038	.350	85.6
11	660	963	101.0		12.2	1342	1.420	.042	.405	100.8
12	720	1051	110.1		14.8	1628	1.715	.051	.495	121.7
13	775	1131	118.6		16.7	1837	1.970	.061	.570	139.9
14	845	1233	129.4		20.5	2255	2.350	.069	.690	166.9
15	920	1342	140.7		25.3	2783	2.750	.080	.790	195.2
16	985	1437	150.6		31.2	3431	3.050	.089	.883	216.6
17	1035	1510	158.4		36.0	3960	3.450	.099	.970	245.0
18	1085	1582	165.9		42.6	4685	3.890	.108	1.125	276.2
19	1125	1641	172.1		47.5	5229	4.150	.112	1.180	294.6
20	1160	1692	177.4		51.0	5610	4.330	.115	1.240	307.4
21	1180	1721	180.5	110	55.5	6110	4.550	0.128	1.290	322.0

REMARKS:

VENTURI NOZZLE REMOVED FROM DISCHARGE DUCT

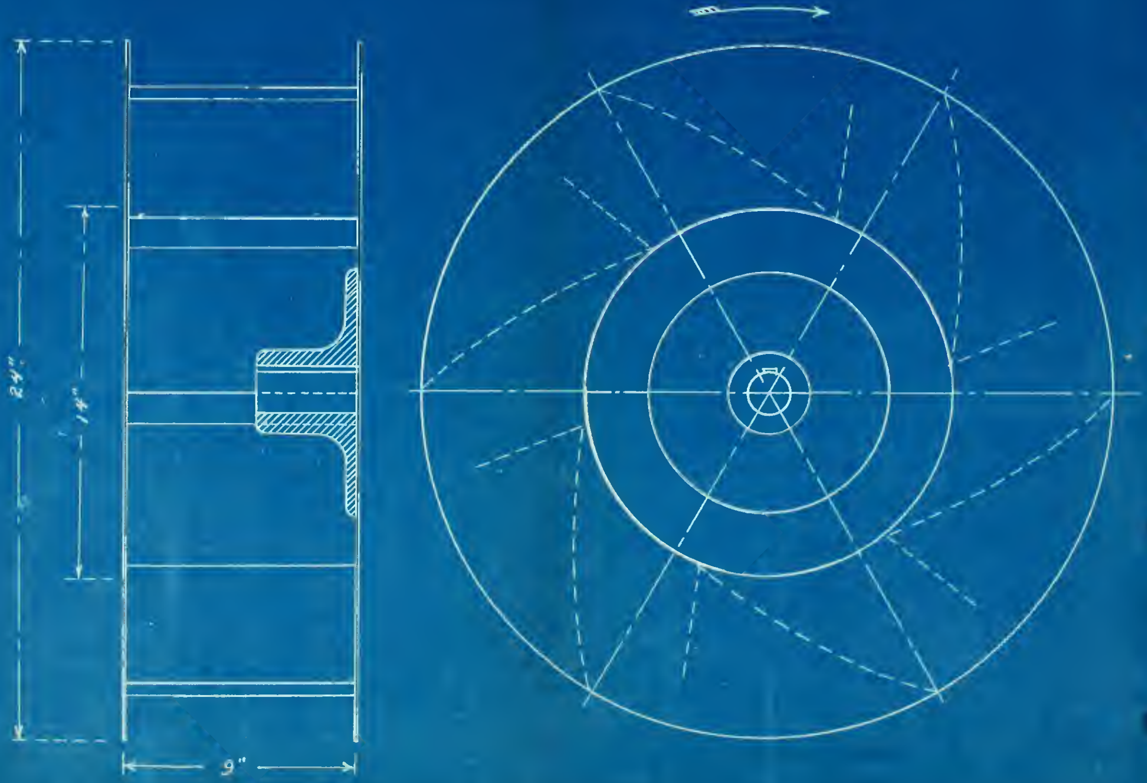
AREA OF DUCT 0.7854 SQ.FT.

MOTOR # 5-S-3976

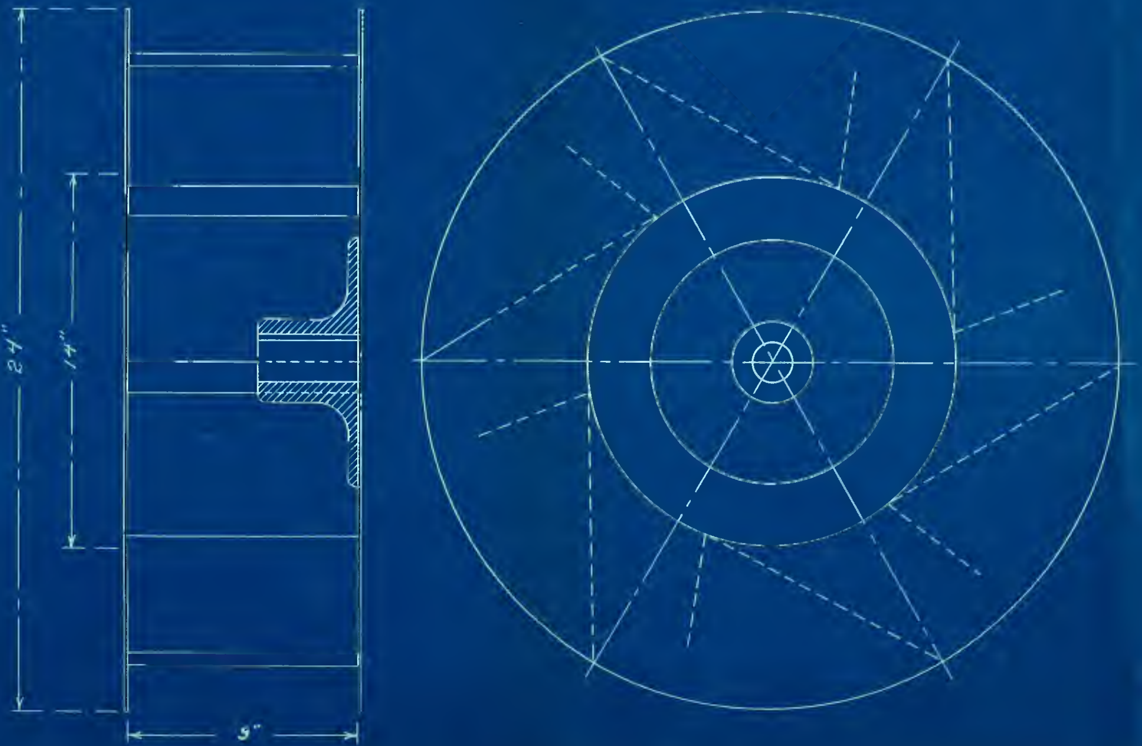
H.P. 5

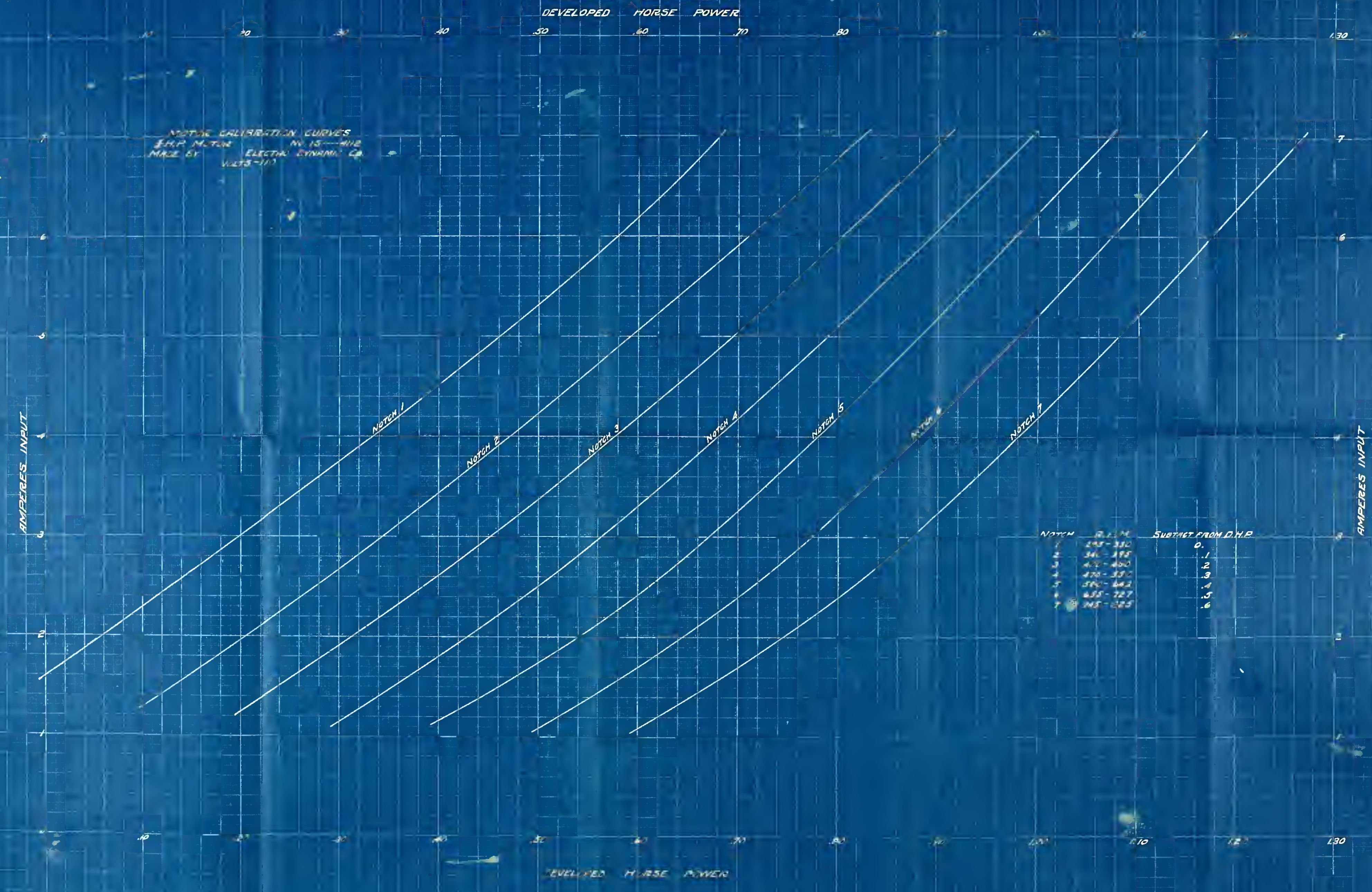
P_A	V_H	V_D	H_B	V_F	C_F	#/SEC.	H.P. IN.	H.P. OUT	M.E. %	EFF. %
.99		8.52	38.61	23.40	18.37	1.340	.0270	0.0941	41.3	34.87
1.07		9.87	46.95	25.20	19.79	1.450	.340	.1233	43.5	36.29
1.35		11.93	54.48	27.60	21.67	1.580	.460	.1580	44.6	34.35
1.56		14.49	66.05	30.55	23.98	1.750	.535	.2103	43.9	39.30
1.92		17.04	78.58	33.20	26.05	1.902	.675	.2715	43.3	40.22
2.20		20.10	91.15	35.96	28.23	2.061	.840	.3415	42.3	40.65
2.70		24.84	113.14	40.00	31.37	2.290	1.055	.4710	43.3	44.65
2.98		28.75	132.53	43.00	33.76	2465	1.310	.5940	39.1	45.35
3.62		35.15	16047	47.65	37.40	2730	1.518	.7970	42.6	52.25
4.33		40.46	184.69	51.00	40.00	2920	1.890	.9810	42.3	51.90
4.90		49.00	22080	56.15	44.10	3.218	2.365	1.2910	42.4	54.60
5.68		56.10	25698	60.10	47.20	3445	2880	1.6100	45.0	55.90
6.32		62.70	285.62	63.45	49.80	3.635	3.530	1.8870	40.5	53.50
7.03		68.90	310.95	66.60	52.25	3.816	4.030	2.1550	40.0	53.45
7.67		79.90	363.79	71.65	56.25	4.109	4.695	2.7190	42.6	57.80
7.95		83.80	386.35	73.40	57.60	4.209	5.080	2.9540	42.0	58.10
8.17		88.10	403.67	75.30	59.10	4.315	5.355	3.1670	41.3	59.10
9.09		91.60	422.69	76.75	60.25	4.400	5.650	3.3850	41.8	59.90

Sketch of 24" Curved Blade Fan Wheel.

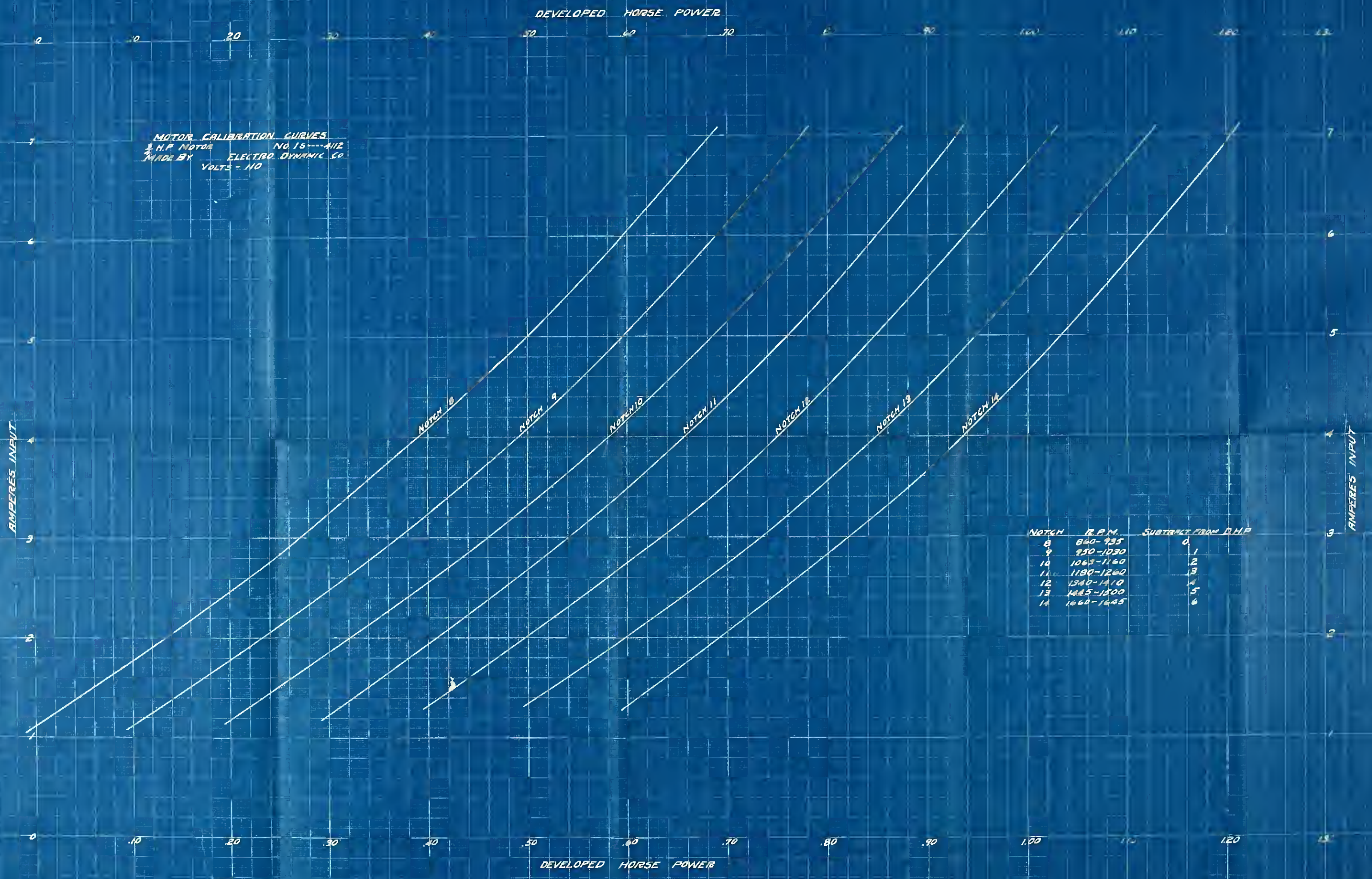


Sketch of 24" Straight Blade Blower.



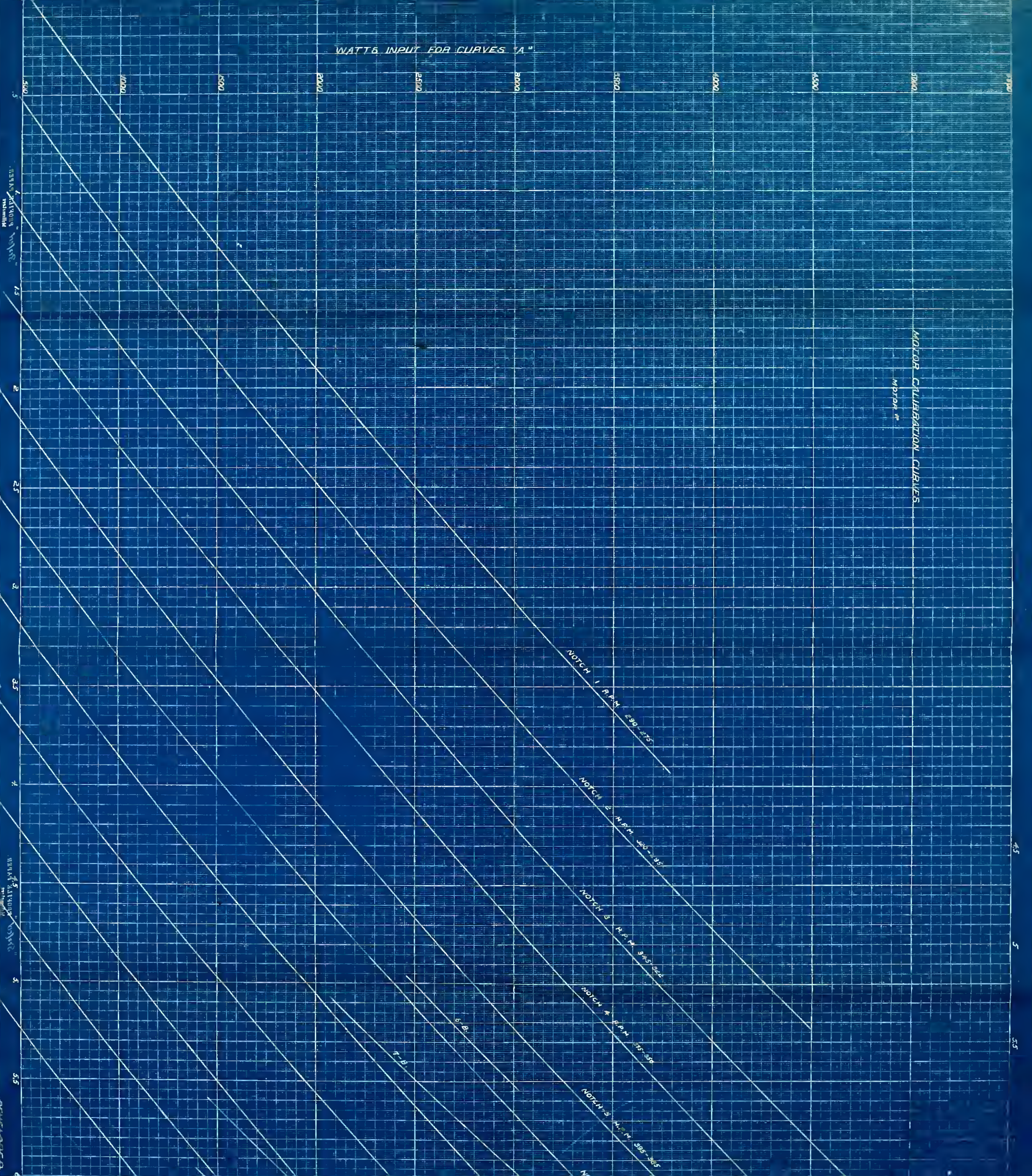


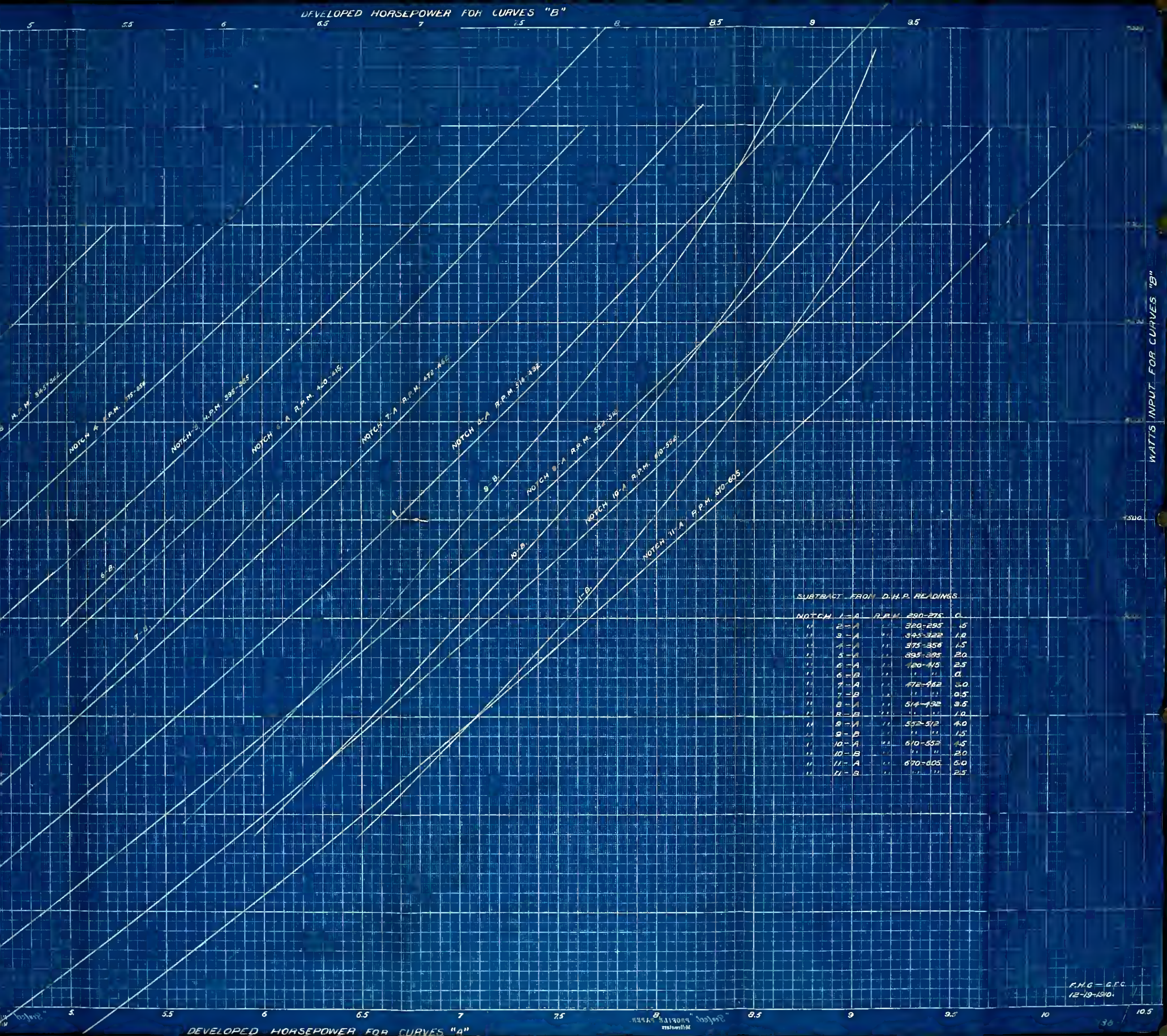
NOTCH	R.P.M.	SUBTACT FROM D.H.P.
1	295 - 330	0.
2	340 - 395	.1
3	400 - 460	.2
4	470 - 550	.3
5	560 - 643	.4
6	655 - 727	.5
7	745 - 825	.6



MOTOR CALIBRATION CURVES
½ H.P MOTOR NO. 15----4112
MADE BY ELECTRO DYNAMIC CO.
VOLTS = 110

NOTCH	R.P.M.	SUBTRACT FROM D.H.P
8	860-935	0
9	950-1030	.1
10	1063-1160	.2
11	1180-1260	.3
12	1340-1410	.4
13	1445-1500	.5
14	1660-1645	.6

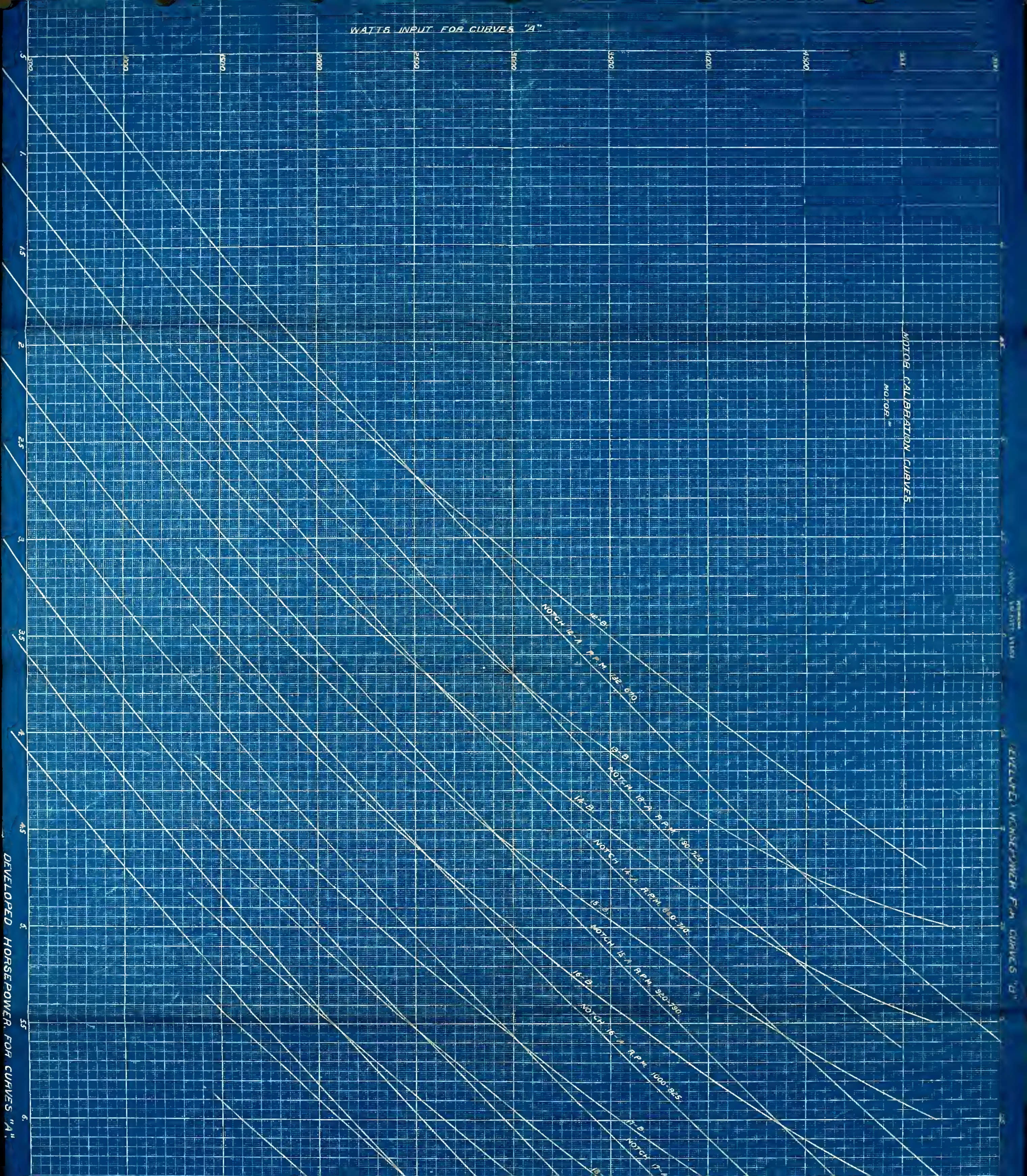

WATTS INPUT FOR CURVES "A"
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
4.5
5
5.5
MOTOR CALIBRATION CURVES
MOTOR "
NOTCH 1 R.P.M. 290-275
NOTCH 2 R.P.M. 340-295
NOTCH 3 R.P.M. 345-326
NOTCH 4 R.P.M. 375-350
NOTCH 5 R.P.M. 395-365
6-B.
7-B.

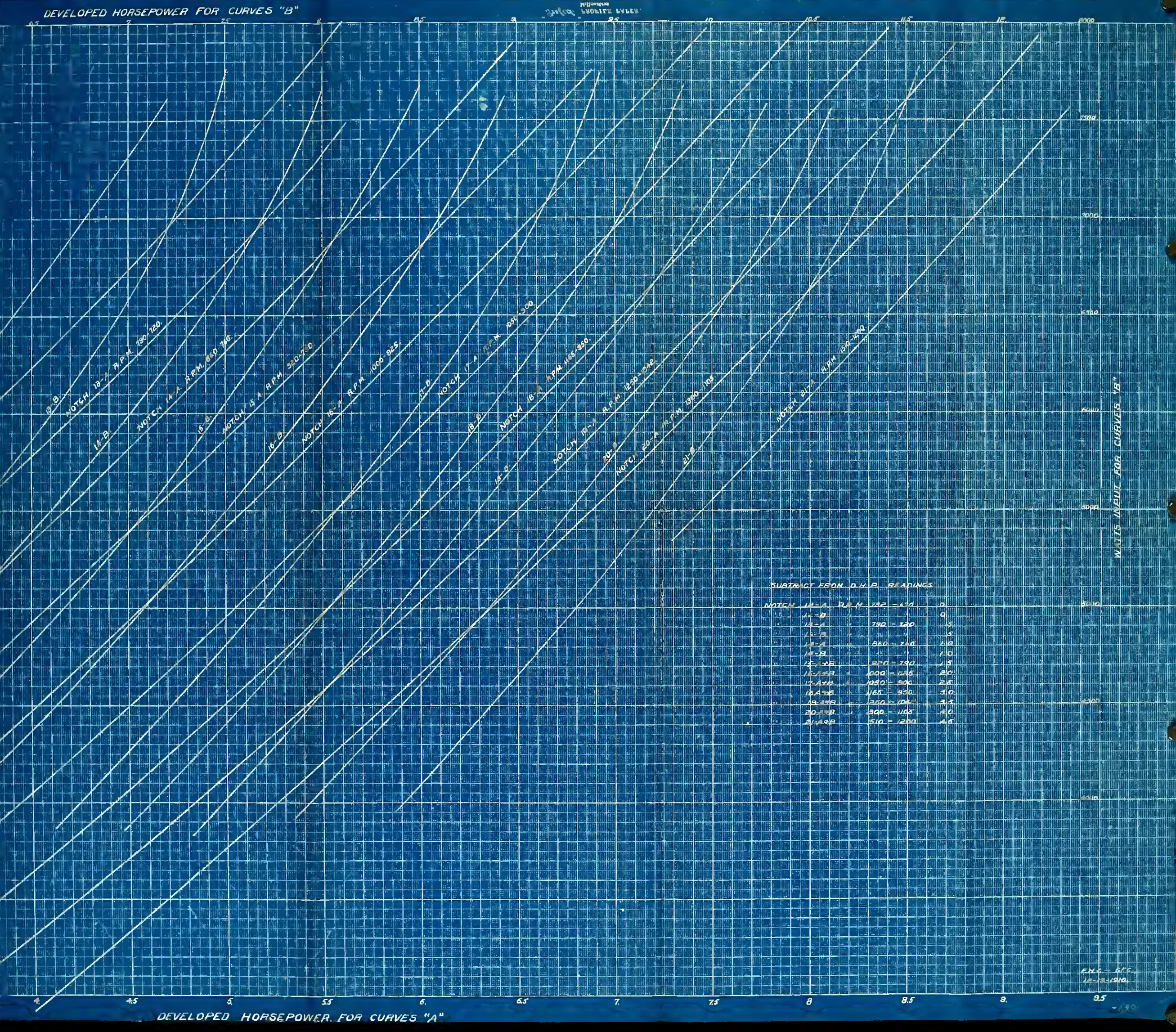


SUBTRACT FROM D.H.P. READINGS.

NOTCH	1-A	R.P.M.	290-275	0.
"	2-A	"	320-295	.5
"	3-A	"	345-322	1.0
"	4-A	"	375-356	1.5
"	5-A	"	395-385	2.0
"	6-A	"	420-415	2.5
"	6-B	"	" "	0.
"	7-A	"	472-462	3.0
"	7-B	"	" "	0.5
"	8-A	"	514-492	3.5
"	8-B	"	" "	1.0
"	9-A	"	552-512	4.0
"	9-B	"	" "	1.5
"	10-A	"	610-552	4.5
"	10-B	"	" "	2.0
"	11-A	"	670-605.	5.0
"	11-B	"	" "	2.5

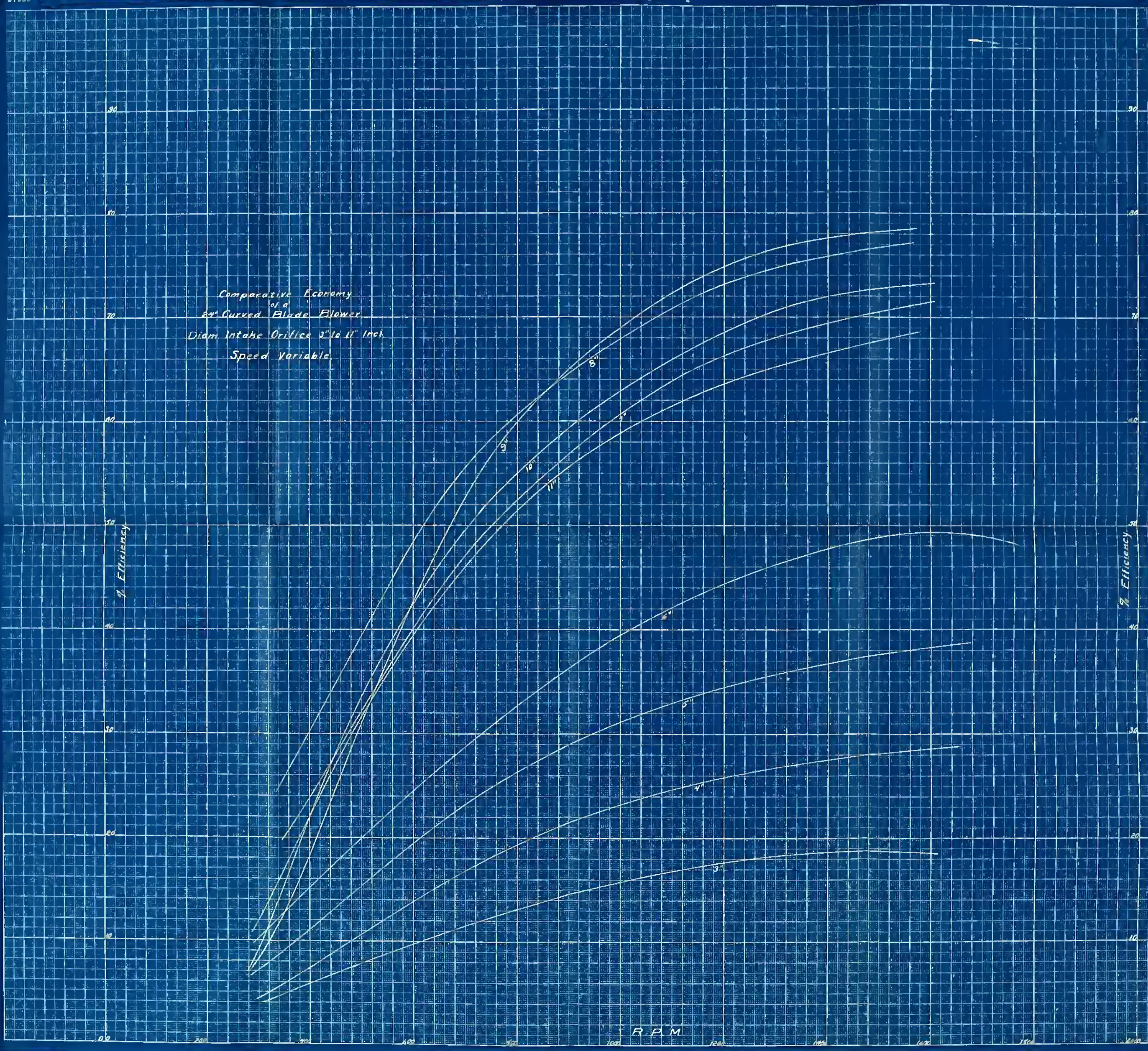
F.H.G — G.F.C.
12-19-1910.


WATTS INPUT FOR CURVES "A"
500
1000
1500
2000
2500
3000
3500
4000
4500
.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
DEVELOPED HORSEPOWER FOR CURVES "A".
DEVELOPED HORSEPOWER FOR CURVES "B"
MOTOR CALIBRATION CURVES.
MOTOR
12-B.
NOTCH 12-A R.P.M. 732-610.
13-B
NOTCH 13-A R.P.M. 790-720.
14-B.
NOTCH 14-A R.P.M. 860-760.
15-B.
NOTCH 15-A R.P.M. 920-790.
16-B.
NOTCH 16-A R.P.M. 1000-825.
17-B.
NOTCH 17-A



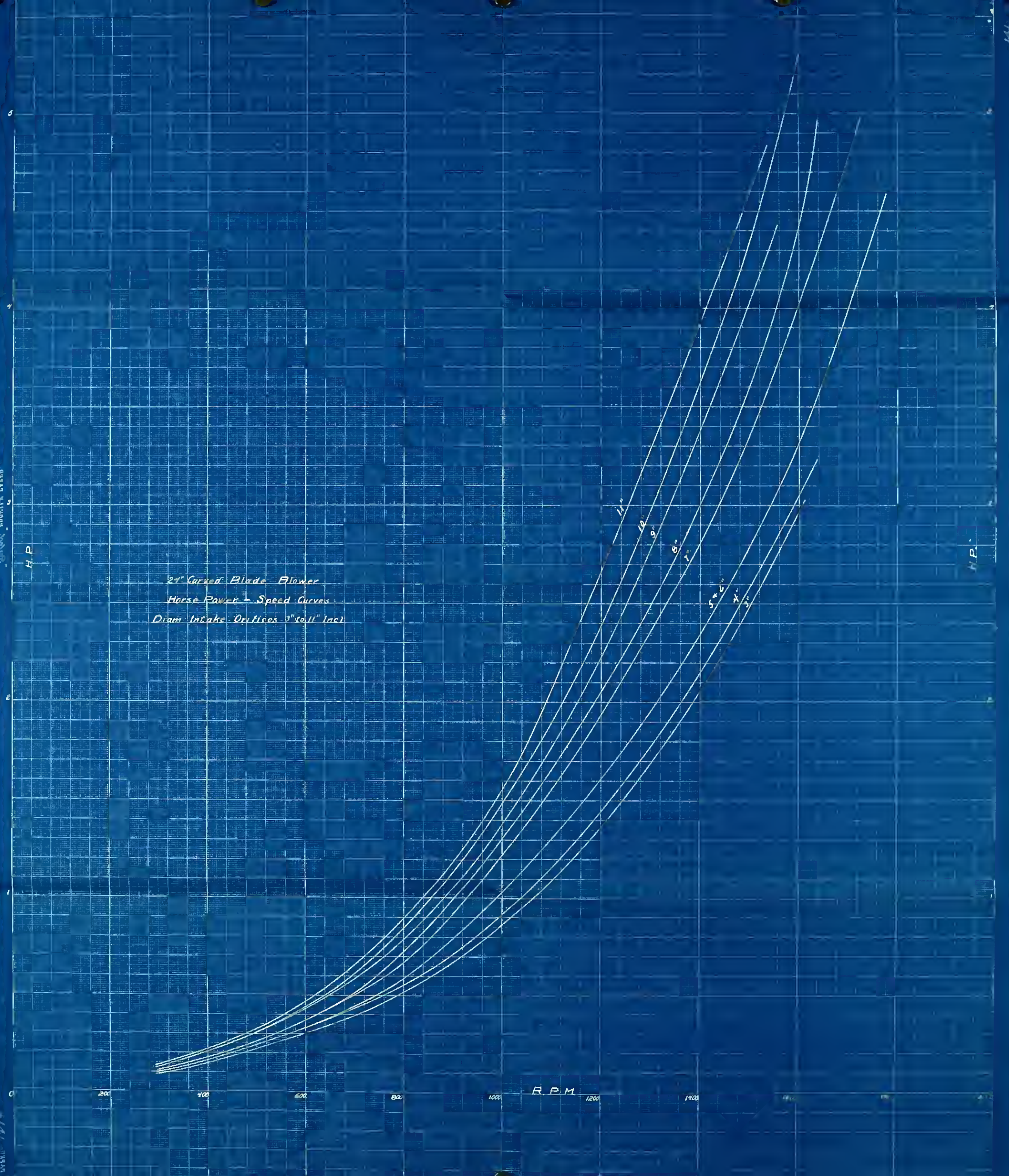
SUBTRACT FROM D.H.P. READINGS

NOTCH	12-A	R.P.M.	732 – 670	0
"	12-B	"	"	0
"	13-A	"	790 – 720	.5
"	13-B	"	" "	.5
"	14-A	"	860 – 740	1.0
"	14-B	"	" "	1.0
"	15-A+B	"	920 – 790	1.5
"	16-A+B	"	1000 – 825	2.0
"	17-A+B	"	1050 – 900	2.5
"	18-A+B	"	1165 – 950	3.0
"	19-A+B	"	1250 – 1042	3.5
"	20-A+B	"	1300 – 1105	4.0
"	21-A+B	"	1510 – 1200	4.5

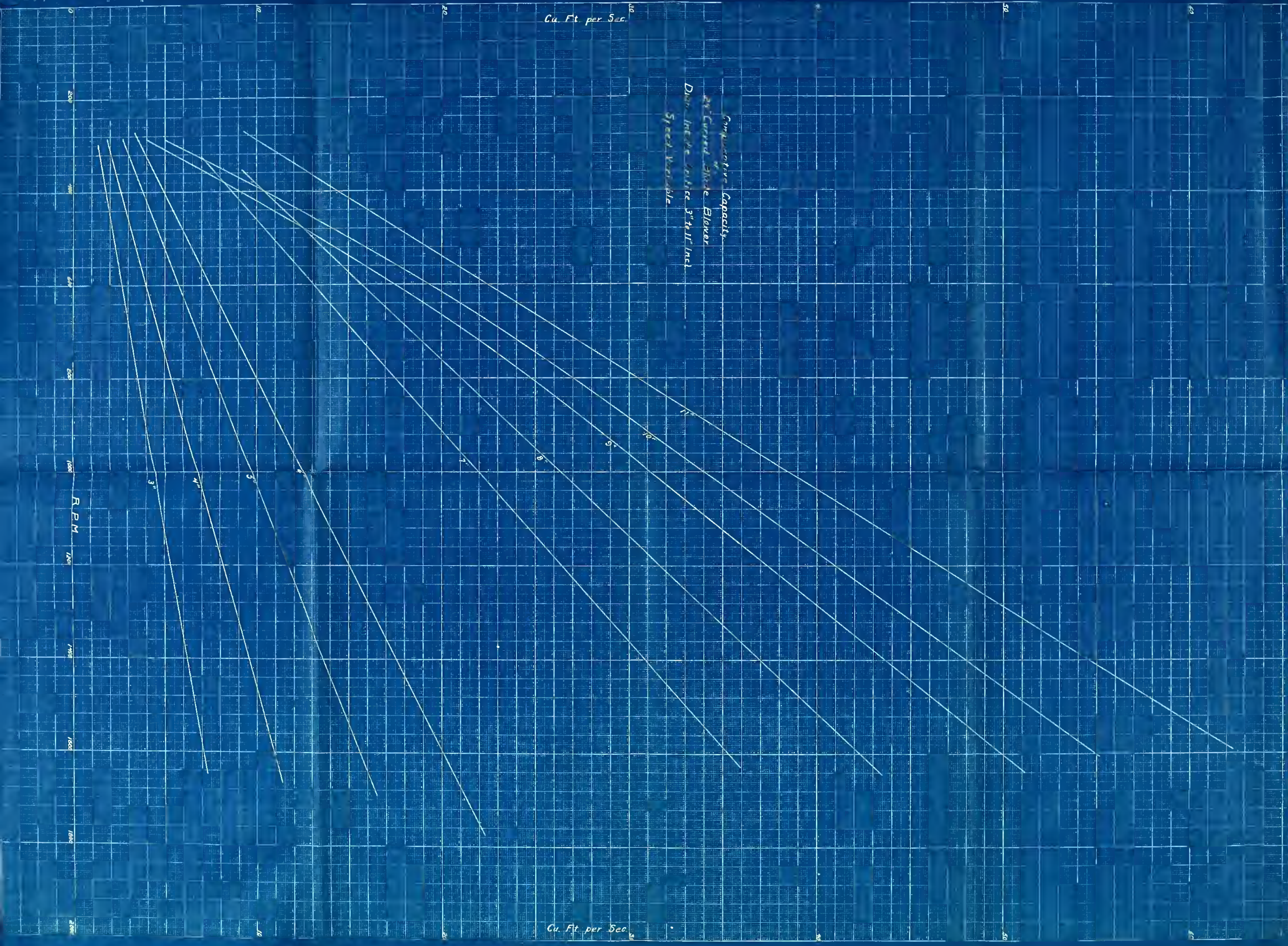


Comparative Economy
of a
24" Curved Blade Blower
Diam. Intake Orifice 3" to 11" Inch
Speed Variable

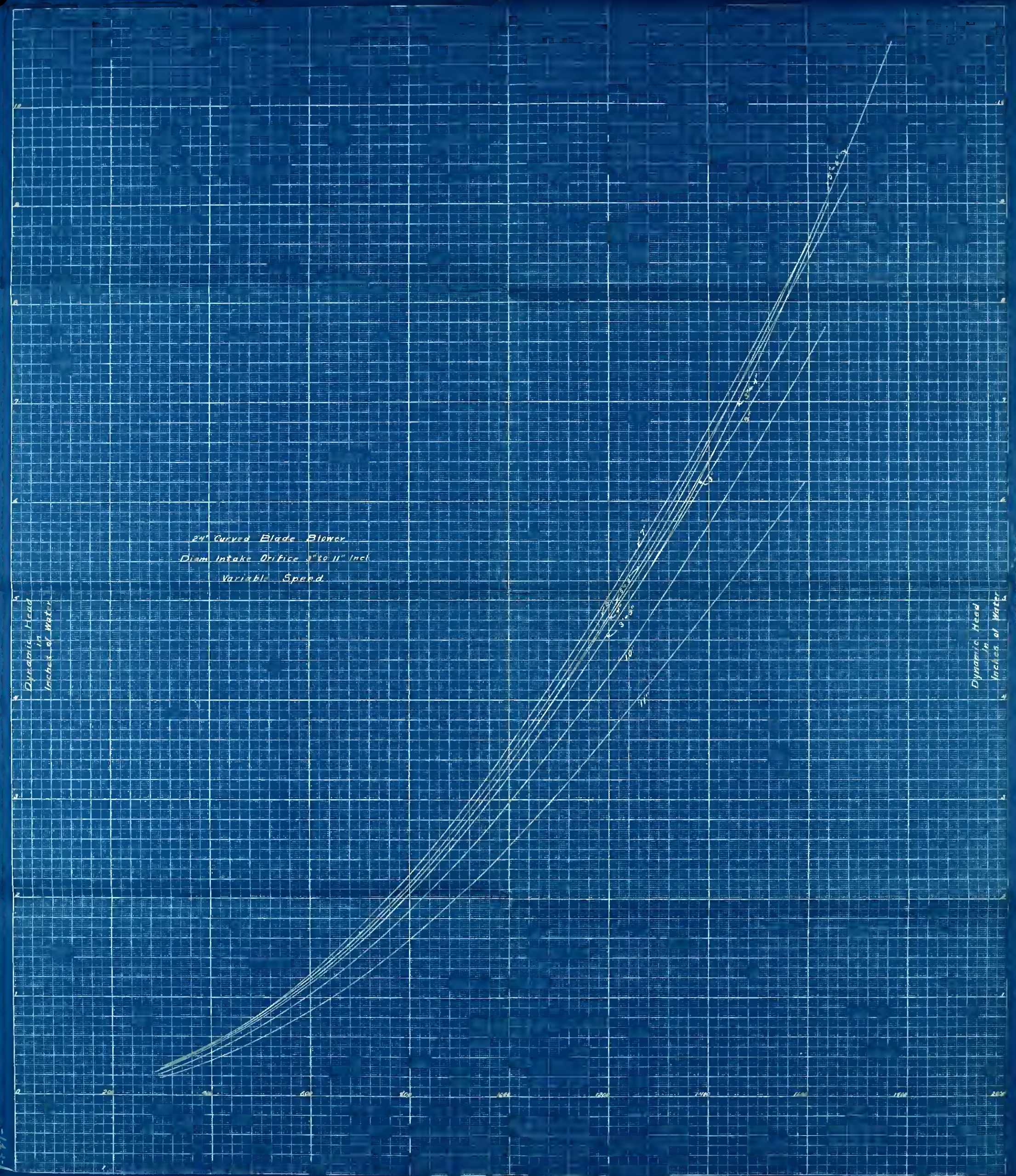
-140



24" Curved Blade Blower
Horse Power – Speed Curves
Diam Intake Orifices 3" to 11" Incl



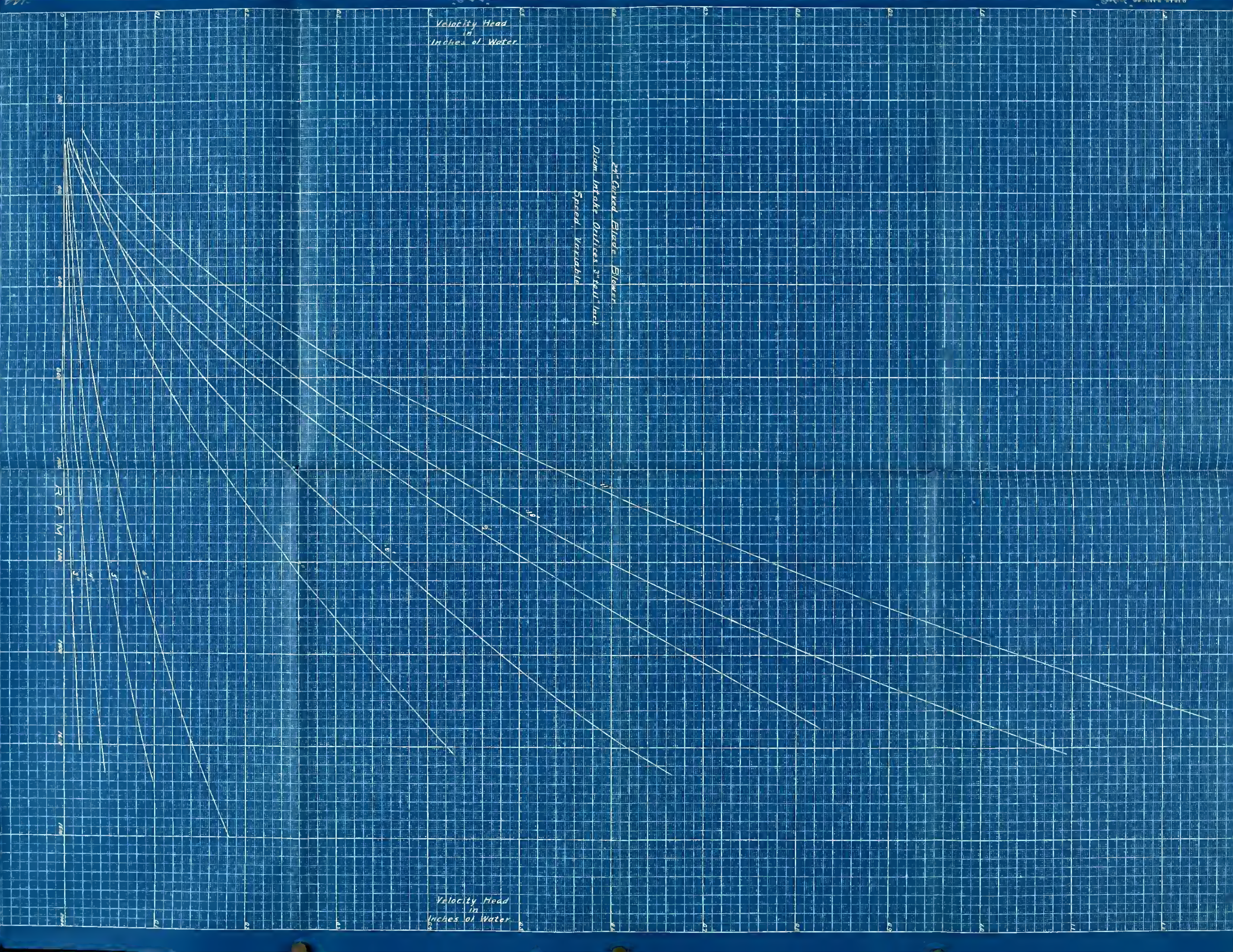
Comparative Capacity
of
24" Curved Blade Blower
Disch. Intake Orifice 3" to 11" Incl.
Speed Variable

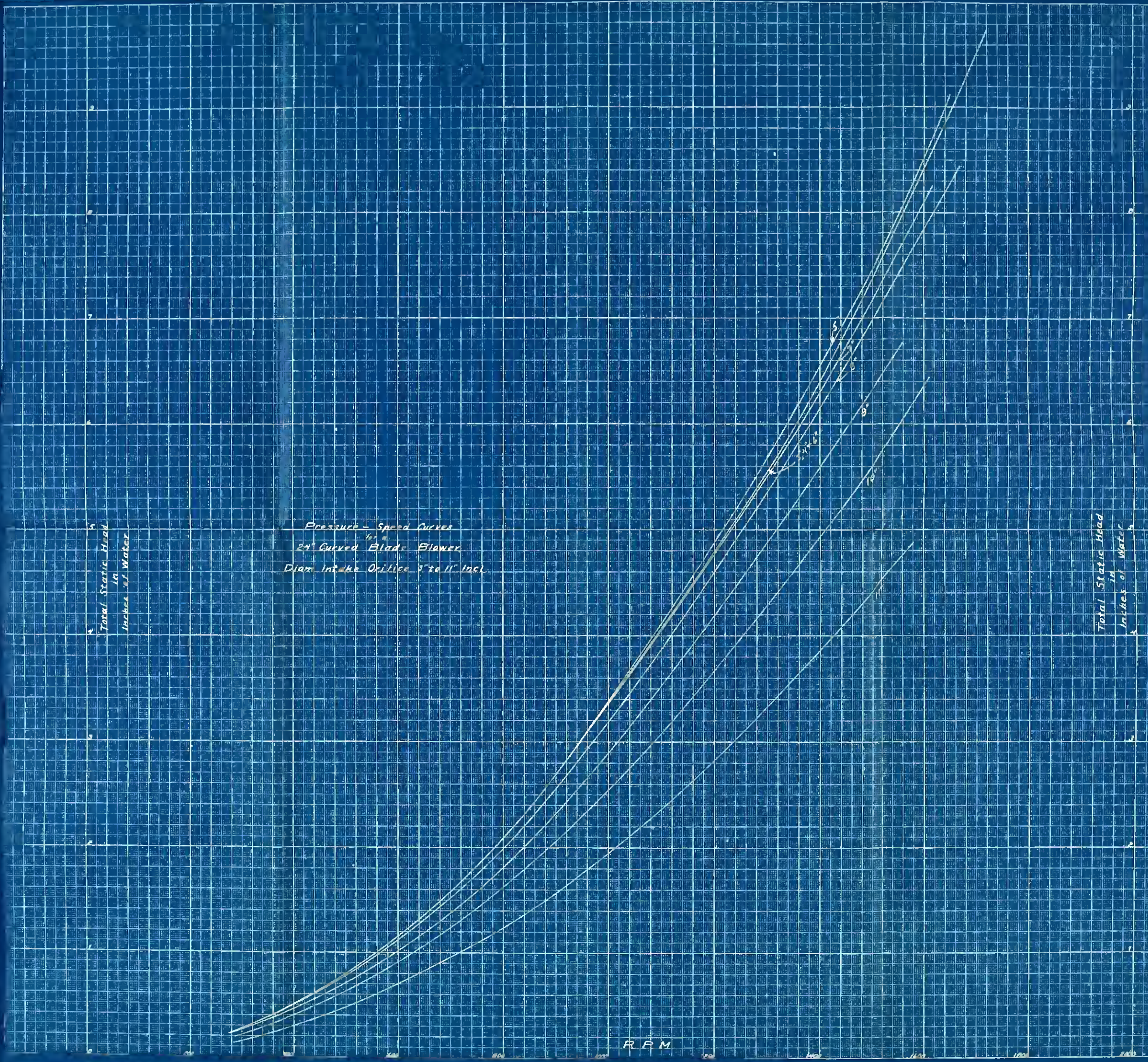


24" Curved Blade Blower

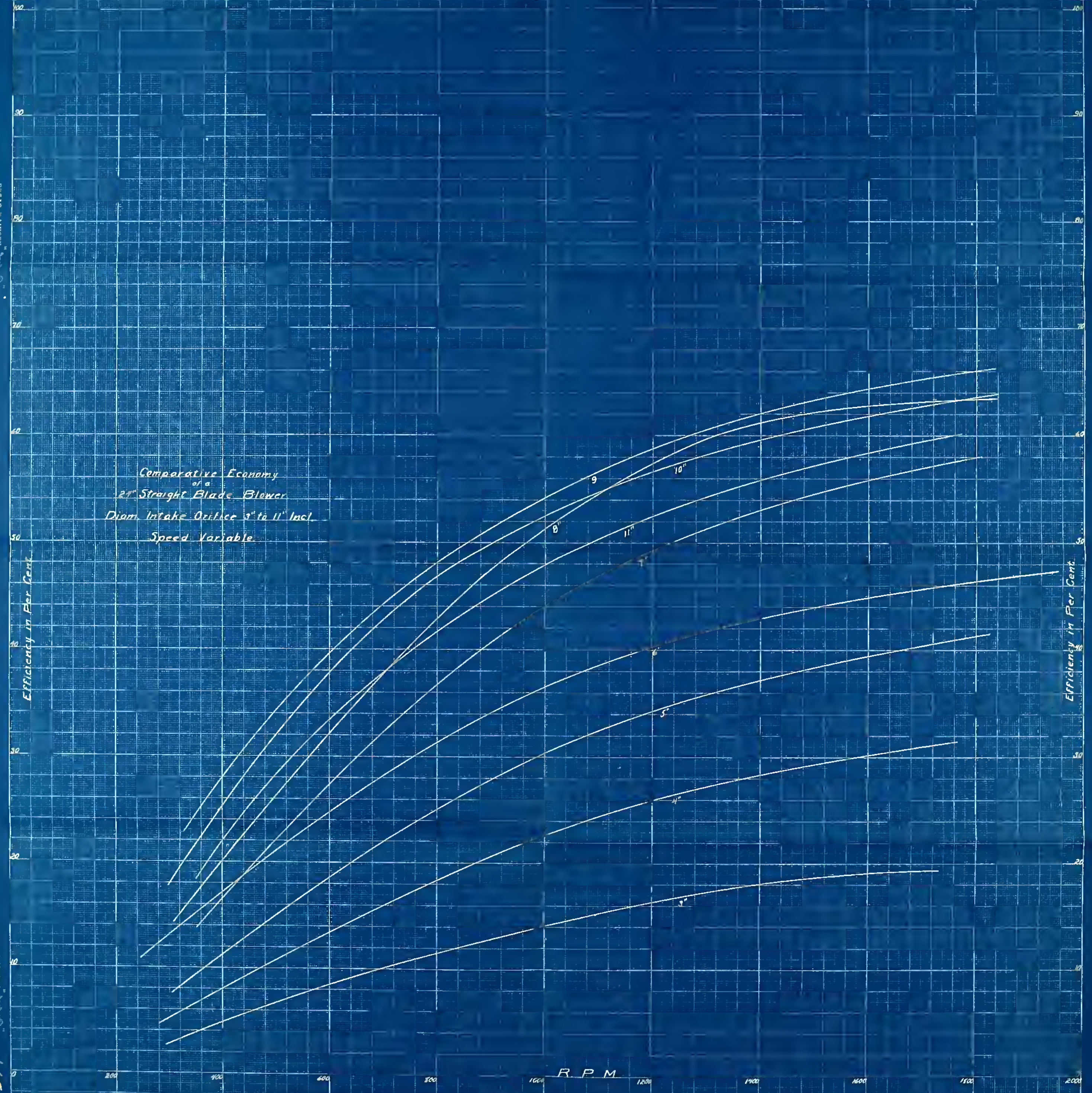
Diam Intake Orifice 3" to 11" Incl

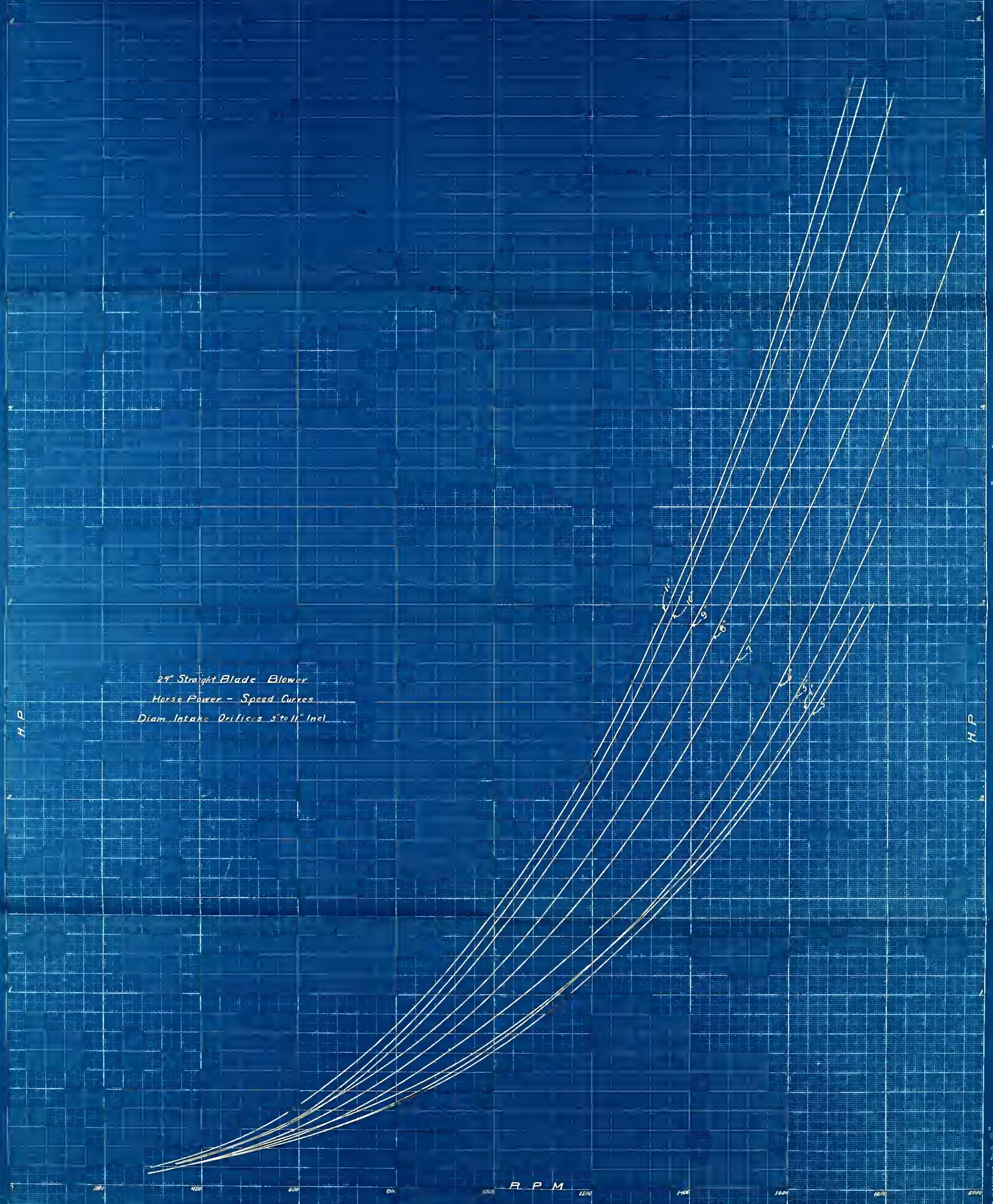
Variable Speed


Velocity Head in Inches of Water
24" Curved Blade Blower
Diam Intake Orifices 3" to 11" Inch
Speed Variable
R P M
800
1000
1200
3"
4"
5"
6"
8"
9"
10"
11"
Velocity Head in Inches of Water

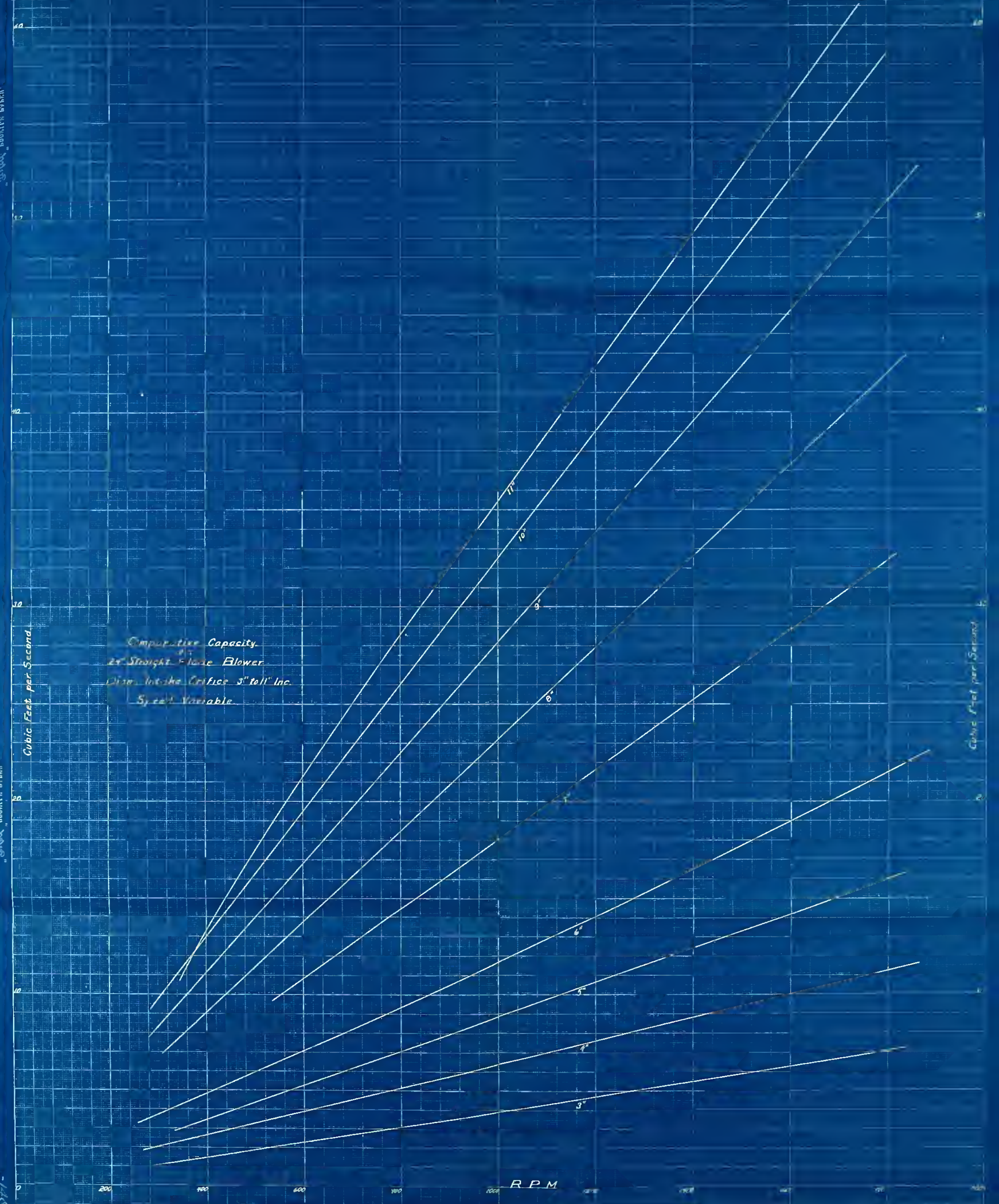


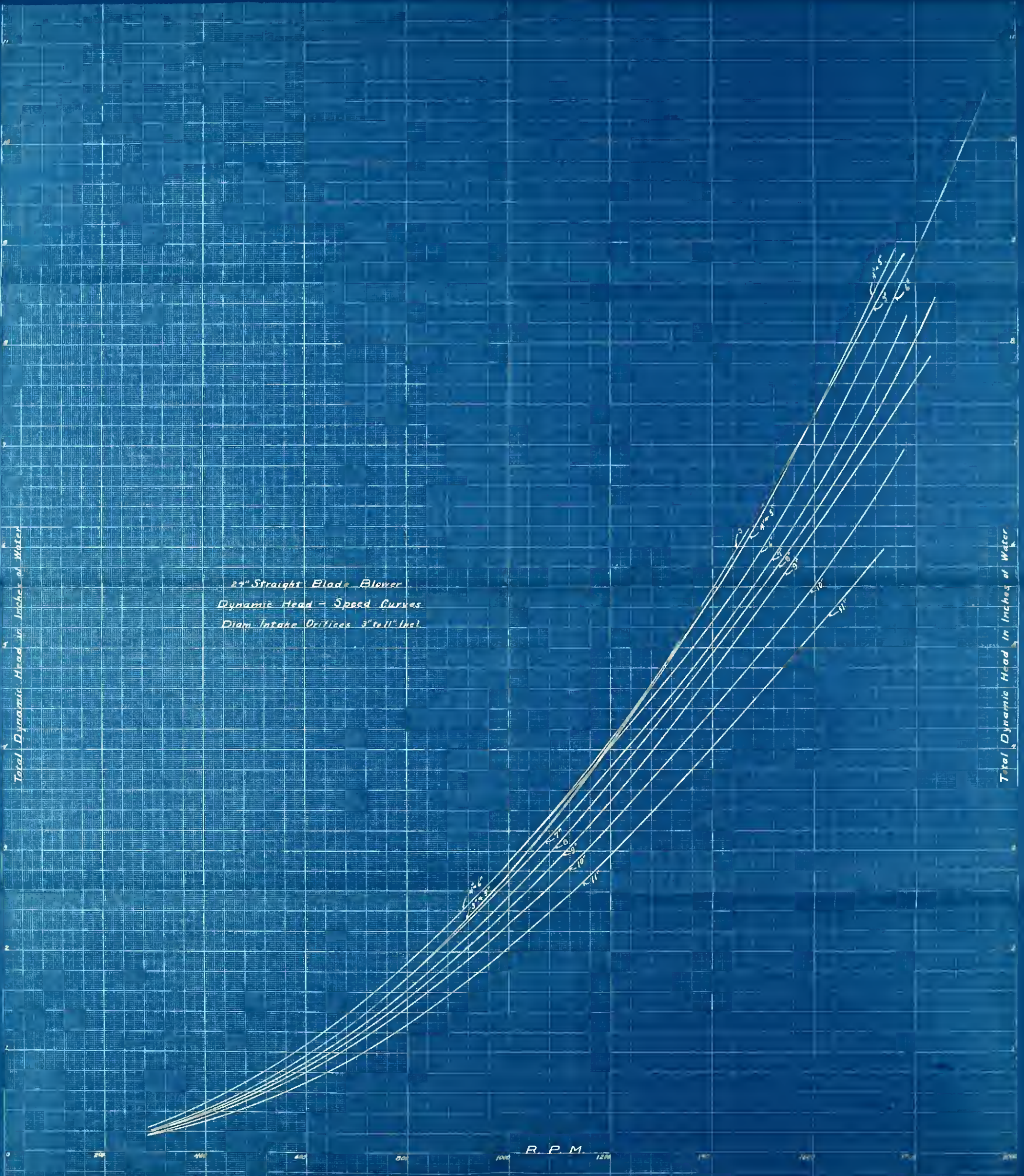
Pressure – Speed Curves
for a
24" Curved Blade Blower
Diam. Intake Orifice 3" to 11" Incl.

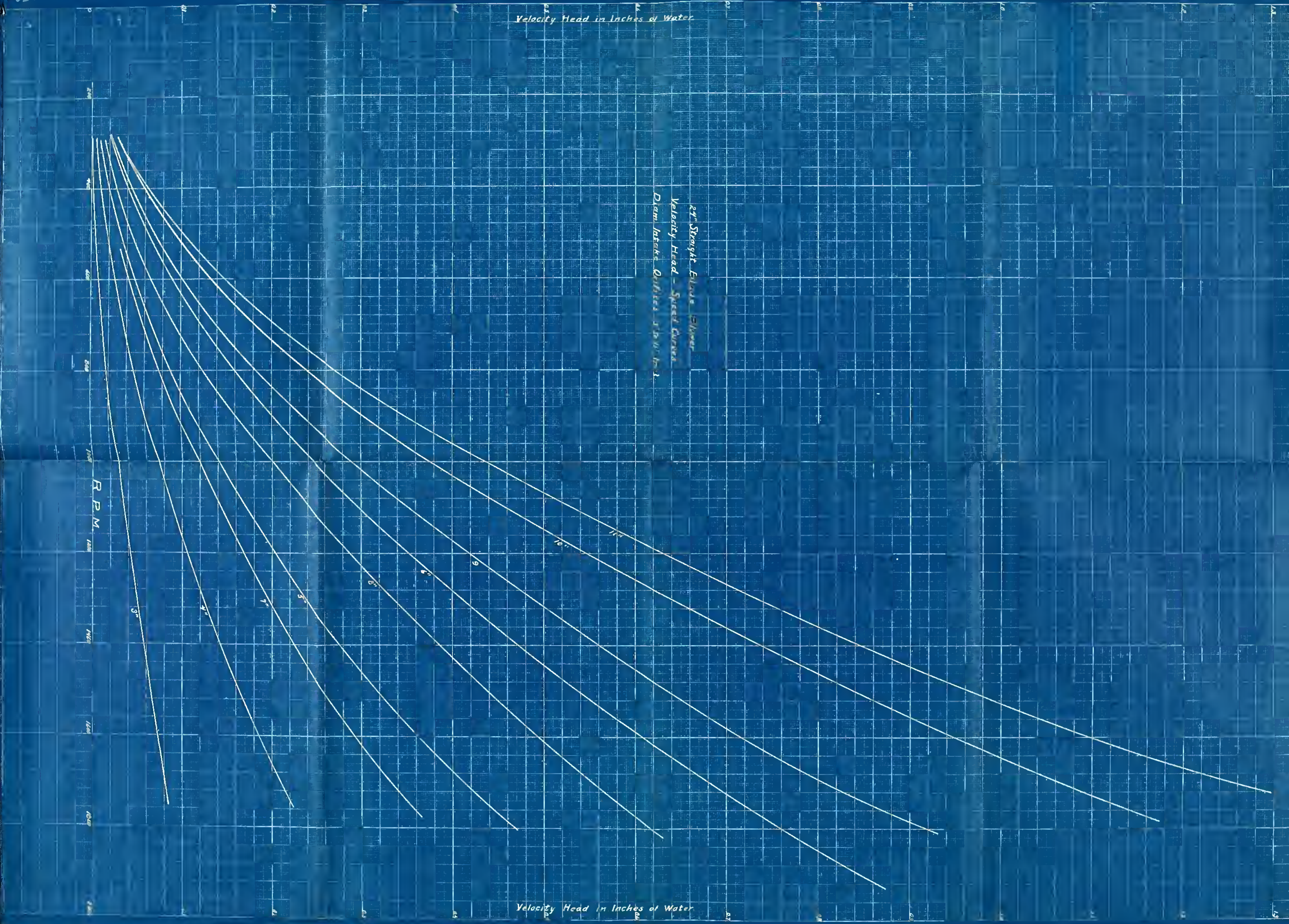

Comparative Economy
of a
21" Straight Blade Blower
Diam. Intake Orifice 3" to 11" Incl.
Speed Variable
Efficiency in Per Cent
Efficiency in Per Cent
R. P. M.
0
10
20
30
40
50
60
70
80
90
100
200
400
600
800
1000
1200
1400
1600
1800
2000
3"
4"
5"
6
7
8"
9
10"
11"



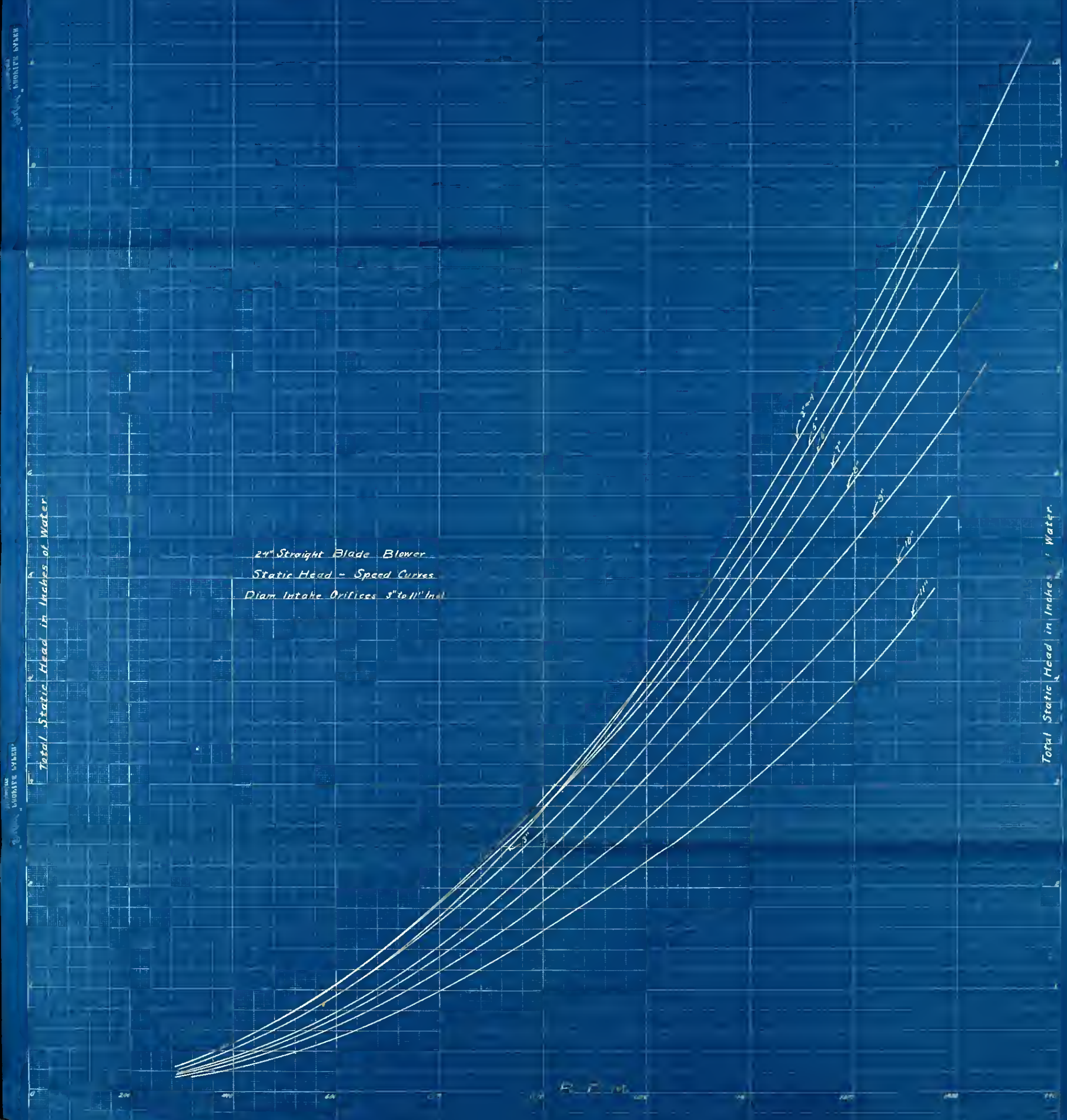
24" Straight Blade Blower
Horse Power – Speed Curves
Diam. Intake Orifices 3" to 11" Incl.


Comparative Capacity
of
24" Straight Plate Blower.
Diam. Intake Orifice 3" to 11" Inc.
Speed Variable.
Cubic Feet per Second.
Cubic Feet per Second.
R P M
0
200
400
600
800
1000
10
20
30
40
50
60
3"
4"
5"
6"
7"
8"
9"
10"
11"


24" Straight Blade Blower
Dynamic Head - Speed Curves
Diam Intake Orifices 3" to 11" Incl.
Total Dynamic Head in Inches of Water
Total Dynamic Head in Inches of Water
R. P. M.
0
200
400
600
800
1000
1200
3"
4" & 5"
6"
7"
8"
9"
10"
11"



27" Straight Blade Blower
Velocity Head - Speed Curves
Diam. Intake Orifices 3 to 11 in.


24" Straight Blade Blower
Static Head – Speed Curves
Diam Intake Orifices 3" to 11" Incl
Total Static Head in Inches of Water
Total Static Head in Inches of Water
R. P. M.
0
200
400
600
3" and 4"
5"
6"
7"
8"
9"
10"
11"
3"